

CA2ALQG
50 H2Q
Dec 13/51
Vol 33



The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

IN THE MATTER OF THE GAS RESOURCES PRESERVATION ACT

AND IN THE MATTER of a Joint Hearing to determine various questions
relating to the proposed Export of Natural Gas from the Province of Alberta.

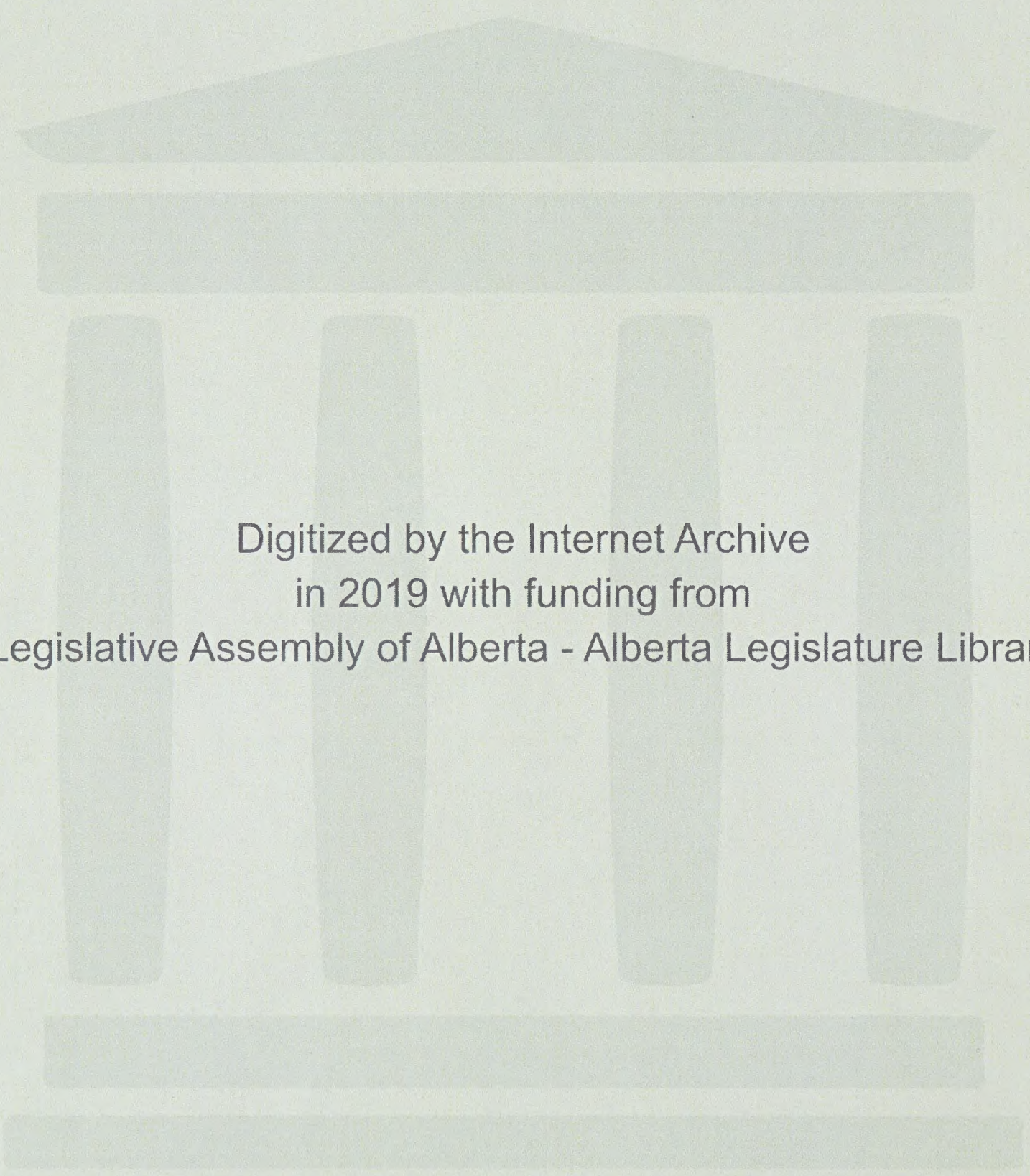
I. N. McKinnon Esq., Chairman

D. P. Goodall Esq.

Dr. G. W. Govier

Session: December 13th, 1951.

Volume 33.



Digitized by the Internet Archive
in 2019 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

I N D E X

VOLUME 33

13 December 1951

W I T N E S S E S

Page

J. G. SHATTUCK

Direct Examination by Mr. Porter,.....	3154
Cross-Examination by Mr. S.B. Smith,.....	3156
Cross-Examination by Mr. McDonald,.....	3157
Cross-Examination by Mr. Mahaffy,.....	3157
Cross-Examination by Mr. Milvain,.....	3158
Examination by Mr. C.E. Smith,.....	3159
Examination by Dr. Govier,.....	3160
Examination by The Chairman,.....	3160

NORMAN A. RAULT

Direct Examination by Mr. Porter,.....	3161
--	------

EVERETT G. TROSTEL

Direct Examination by Mr. Porter,.....	3162
Examination by Dr. Govier,.....	3213
Cross-Examination by Mr. Steer,.....	3215
Cross-Examination by Mr. Nolan,.....	3227
Cross-Examination by Mr. S.B. Smith,.....	3228
Cross-Examination by Mr. McDonald,.....	3240
Cross-Examination by Mr. Mahaffy,.....	3244
Cross-Examination by Mr. Macleod,.....	3249
Re-Examination by Mr. Porter,.....	3251
Examination by Mr. C.E. Smith,.....	3253
Examination by Dr. Govier,.....	3254
Examination by The Chairman,.....	3286
Examination by Dr. Govier,.....	3287
Examination by The Chairman,.....	3288

W. C. WHITTAKER

Direct Examination by Mr. Milvain,.....	3290
Examination by Mr. C.E. Smith,.....	3298
Cross-Examination by Mr. McDonald,.....	3298
Examination by The Chairman,.....	3299

ANGUS J. MORRISON

Direct Examination by Mr. Milvain,.....	3301
Cross-Examination by Mr. Porter,.....	3302
Cross-Examination by Mr. Macleod,.....	3304

E X H I B I T S

No.

117	Statement prepared by J.G. Shattuck on behalf of Trans-Canada Pipe Lines,.	3154
118	Submission by E.G. Trostel, "Illustrative Deliverability Schedules,".....	3163
119	Submission of Western Coal Federation of Canada,.....	3290
	Table II Revised, submitted by Trans- Canada Pipe Lines marked as part of Exhibit 57,.....	3256

J. G. Shattuck,
Dir. Ex. by Mr. Porter.

- 3154 -

VOLUME 33.

December 13th, 1951.

MR. PORTER: Call Mr. Shattuck.

J. G. SHATTUCK, recalled.

Q BY MR. PORTER: Mr. Shattuck, when you were last on the stand you were requested by the Board to prepare some statements, which I understand you have with you?

A Yes, sir.

STATEMENTS NOW MARKED
EXHIBIT 117.

Q Will you just explain to the Board what they contain?

A There are five sheets arranged in two schedules. Schedule 1 has three tables. Table A of Schedule 1 is the first, third and fifth year statement of income and earnings, based upon minimum average rates for sales, to which I testified earlier, these sales being below the level at which we believe these sales will actually be made. This table or income statement shows earnings to which I have testified earlier, of 4.3% in the first year, 6% in the third year, and 7.1% in the fifth year. On Table A is an estimate was prepared showing the amounts of sales and based on the rate base used in calculating the dollar income per cent of rate base to which I have previously referred as earnings. Table C of Schedule 1 shows the income statements for the first, third and fifth years at levels of revenue at average rates at which we expect to sell the gas, namely the price to distributors is an average of 53 cents per Mcf on the sales to industrials at 45 cents per Mcf. The earnings with such revenue is

VOLUME 33.

December 13th, 1951.

MR. PORTER:

Call Mr. Shattuck.

J. G. SHATTUCK, recalled.

BY MR. PORTER:

Mr. Shattuck, when you were last at the stand you were requested by the Board to prepare

some statements, which I understand you have with you?

Yes, sir.

STATEMENTS NOW MARKED
EXHIBIT 117.

Will you just explain to the Board what they contain?

There are five sheets arranged in two schedules. Sched-

has three tables. Table A of Schedule I is the first

third and fifth year statement of income and earnings

based upon minimum average rates for sales, to which I

testified earlier, these sales being below the level

which we believe these sales will actually be made. The

table of income statement shows earnings to which I have

testified earlier, of 4.3% in the first year, 6% in the

third year, and 7.5% in the fifth year. On

Table A is an estimate was prepared showing the amount

of sales and based on the rate base used in calculating

the dollar income per cent of rate base to which I have

previously referred as earnings. Table C of Schedule I

shows the income statements for the first, third and fifth

years at levels of revenue at average rates at which we

expect to sell the gas, namely the rates to distributors

is an average of 55 cents per Mcf on the sales to industry

at 45 cents per Mcf. The earnings with such revenue is

J. G. Shattuck,
Dir. Ex. by Mr. Porter.

- 3155 -

estimated to be $5\frac{1}{2}\%$ for the first year, 7.3% for the third year and 8% for the fifth year. The same sales as shown at the bottom of Table A and the same rate base as shown on Table B have been used in that calculation. Schedule II shows a similar income statement in Table A, but reflecting an ultimate of $271\frac{1}{2}$ million dollars construction cost. The earnings, and this is a statement of income and earnings based upon a minimum average rate for sales and shows a utility income as per cent of rate base 4.2% in the first year, 5.7% in the third year, and 6.6% in the fifth year.

Q That is assuming a minimum price basis?

A Yes, sir.

Q Lower than you anticipate?

A Yes, sir. Table B states the rate base reflecting the $271\frac{1}{2}$ million construction costs.

Q Perhaps you should explain your Table B construction cost, because you speak of $271\frac{1}{2}$ million and you start off with 263.3?

A Yes, sir.

Q In your table.

A The construction as described by Mr. Warterfield, having some 94,000 horsepower of installed capacity and a 30-inch pipe line through to Toronto and the remaining portion of his plant, is more than adequate to make the first few years service. I have taken, with Mr. Warterfield's assistance, the portion of that plant as necessary in each year, and have installed it as needed, based upon my market estimates, and have compiled the plant figures based upon such a study.

Q That would work in with either the 263 or the 271?

estimated to be 2 1/2% for the first year, 7.3% for the second year and 8% for the fifth year. The same sales as shown at the bottom of Table A and the same rate base as shown on Table B have been used in this calculation. Schedule shows a similar income statement in Table A, but reflected an estimate of 27 1/2 million dollars construction cost, earnings, and this is a statement of income and earnings based upon a minimum average rate for sales and shows a utility income as a percent of rate base 4.2% in the first year, 5.7% in the third year, and 6.6% in the fifth year.

That is assuming a minimum price basis?

Yes, sir.

Lower than you anticipated?

Yes, sir. Table B shows the rate base reflecting the 27 1/2 million construction cost.

Perhaps you should explain your Table B construction cost because you speak of 27 1/2 million and you state off with 253.3?

Yes, sir.

In your table.

The construction as described by Mr. Waterfield, having some 24,000 horsepower of installed capacity and a 30-inch pipe line through to Toronto and the remaining portion of his plant, is more than adequate to make the first few years service. I have taken, with Mr. Waterfield's assistance, the portion of that plant as necessary in each year, and have installed it as needed, based upon my market estimates and have compiled the plant figures based upon such a study. That would work in which either the 253 or the 27 1/2

J. G. Shattuck,
Dir. Ex. by Mr. Porter.
Cr. Ex. by Mr. S. B. Smith.

- 3156 -

A Yes.

Q It is appropriate to either?

A Yes, sir, it is appropriate to either.

Q And that explains the difference of that starting point of 263 million and an estimate of an ultimate 271 is merely a deferment of capacity to date of use?

A That is right, and I have based these figures on Mr. Warterfield's plant as he described it to be necessary at the beginning of the fifth year.

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q Can you tell me on what basis you proceeded so far as the amount of sales to distributors and sales to industrials - would you mind giving me that in thousands of cubic feet?

A I believe that was referred to at the bottom of Table A of Schedule I, if I understand you correctly.

Q I am sorry. Oh yes. Now, can you give me -- where do I get the price per thousand cubic feet to distributors and industrials? It is a matter of making the division?

A I read that into the record previously but I believe I can find it here. That is on Schedule I, Table A, Calculated Revenue Sales to Distributors in the first year was calculated at $49\frac{1}{2}$ cents per Mcf; in the third year, $51\frac{1}{2}$ cents, and the fifth year, $53\frac{1}{2}$ cents per Mcf. As to industrials we fix 37 cents per Mcf.

Q Throughout?

A Yes, throughout.

Q And your calculation in Table C?

A Table C. Sales to distributors 55 cents and sales to industrials at 45 cents.

Yes.

It is appropriate to either?

Yes, sir, it is appropriate to either.

And that explains the difference of that starting point

203 million and an estimate of an estimate 271 is merely

deferment of capacity to date of use?

That is right, and I have based these figures on Mr. War

field's plant as he described it to be necessary at the

beginning of the fifth year.

CROSS-EXAMINATION BY MR. S. B. SMITH:

Can you tell me on what basis you proceeded so far as to

amount of sales to distributors and sales to industrial

would you mind giving me that in thousands of cubic feet

I believe that was referred to at the bottom of Table A

Schedule I, if I understand you correctly.

I am sorry. Oh yes. Now, can you give me -- where do I

get the price per thousand cubic feet to distributors and

industrial? It is a matter of asking the division?

I read that into the record previously but I believe I can

find it here. That is on Schedule I, Table A, Calculated

Revenue Sales to Distributors in the first year was sales

lated at 42 1/2 cents per Mcf in the third year, 51 1/2 cents,

the fifth year, 53 1/2 cents per Mcf. As to industrial we

fix 37 cents per Mcf.

Throughout?

Yes, throughout.

And your calculation in Table C?

Table C. Sales to distributors 55 cents and sales to

industrial at 45 cents.

J. G. Shattuck,
Cr. Ex. by Mr. S. B. Smith.
Cr. Ex. by Mr. D. P. McDonald.
Cr. Ex. by Mr. Mahaffy.

- 3157 -

Q And Table A, Schedule II?

A The same as Schedule I.

CROSS-EXAMINATION BY MR. D. P. McDONALD:

Q Why do you have a difference in price between the two schedules?

A When I made my tests as to earning power of this pipe line I took the average rate at the lowest end and sometimes below the range of prices at which we anticipate sales. In Table C I have shown the effect of earnings on estimated revenue at the rates we expect to sell at.

Q That is the meaning of the wording at the top of the page of Table A on Schedule I?

A Yes.

CROSS-EXAMINATION BY MR. MAHAFFY:

Q And the rates you have given, would they apply all over the system?

A These are averages for the entire system.

Q Would you give me the rate you expect to charge for gas sold in Alberta along the route?

A In Alberta?

Q Yes?

A I have taken no revenue into this statement for Alberta. Those sales which will be made in Alberta are very small in comparison with the total and would not affect the earning power estimate.

Q Have you arrived at any price?

A No.

Q At which gas will have to be sold?

J. G. Shattuck,
Cr. Ex. by Mr. Mahaffy.
Cr. Ex. by Mr. Milvain.

- 3158 -

A No, I have not.

CROSS-EXAMINATION BY MR. MILVAIN:

Q In answer to my friend Mr. Smith, Mr. Shattuck, you gave him a breakdown of the prices per Mcf on Schedule I, Table A, at $49\frac{1}{2}$, $51\frac{1}{2}$ and $53\frac{1}{2}$. What would be a similar breakdown of Schedule I, Table C?

A I use the same rate, 55 cents, and estimate the revenue from sales to distributors in each of the first, third and fifth years, and use 45 cents as the price to industrials.

Q Would that 45 cents to industrials be the same to interruptible and firm?

A No, that is the average of all classes of sales.

Q What would be the firm rate and what would be the interruptible rate?

A I believe that those rates would be contained in the range of rates to which I testified previously, which was 40 cents to 65 cents per Mcf.

Q 65 at the top and 40 at the bottom?

A That is right.

Q And the same in Schedule II, Table A?

A The same in all respects, Mr. Milvain.

Q And what would be the price range there?

A That is the same as Schedule I, Table A, as far as calculation are you asking me, sir?

Q You gave Mr. Smith a breakdown of Schedule I, Table A of various prices. Now, would your interruptible run in the same range from 40 to 65 for your industrial?

A Yes, sir.

Q How do you get down to 37?

J. G. Shattuck,
Cr. Ex. by Mr. Milvain.
Exam. by Mr. C. E. Smith.

- 3159 -

A Because in estimating at minimum rates I took a point slightly below the lowest end of that range just as a matter of safety and conservatism in estimating the earnings of the pipe line.

Q So that on that basis you go below this average you gave us before of a range of from 40 to 65?

A Yes, sir.

Q Now with respect to Schedule II, Table A, would there be another system of rates that would apply?

A The revenue estimate on Schedule II, Table A, is the same as the revenue estimate of Schedule I, Table A.

Q That is just exactly the same?

A Yes, sir.

EXAMINATION BY MR. C. E. SMITH:

Q Will you repeat your prices on Schedule I, Table A? I have heard of $28\frac{1}{2}$ and $29\frac{1}{2}$ both?

A Average sales to distributors?

Q Yes?

A The first year $49\frac{1}{2}$, the third year $51\frac{1}{2}$, and the fifth year $53\frac{1}{2}$.

Q And would your first year average 49?

A Yes, sir.

(Go to page 3160.)

J. G. SHATTUCK,
Exam. by Dr. Govier.
Exam. by The Chairman.

- 3160 -

EXAMINATION BY DR. GOVIER:

- Q Mr. Shattuck, could you give any cross-reference from Exhibit 117 to 56? I was thinking of the explanation of the item, "Transportation Expenses" which appears on Exhibit 117.
- A The Transportation Expenses on Exhibit 117 are in each case the same as the expenses detailed for the third year in Exhibit 56, starting at the top of page 6. The table at the top of page 6 of Exhibit 56 running down through and including Administrative and General Expenses. Yes, that is right, the figure of \$5,962,000 shown as total operating expense is identical with the third year figure of transportation expense.
- Q And the other figures are the corresponding figures for the first and fifth years, are they?
- A They are, sir.
- Q And is the same statement applicable to general taxes, depreciation and amortization?
- A Yes, sir.
- Q MR. PORTER: Exhibit 56 actually includes in costs an earning based on 7 per cent after taxes?
- A It does.

EXAMINATION BY THE CHAIRMAN:

- Q Mr. Shattuck, I think you explained the difference between your 271 million total cost in regard to Table B of Schedule 2 and the figure of 263 million in that you were not going to instal all the horsepower to start with?
- A And some other facilities. For example, some of the laterals would not be necessary because some of the

J. G. Shattuck,
Exam. by The Chairman.
Norman A. Rault,
Dir. Ex. by Mr. Porter.

- 3161 -

distributing systems for the smaller communities would not be hooked up immediately.

Q Your gathering system?

A No, the sales laterals.

Q I notice in Table B of Schedule 1 you have a build-up there as well. That was on account of laterals?

A That is solely on account of laterals.

Q Cost of gas re-sold, is that taken at 10 cents, Mr. Shattuck?

A That is taken at 10 cents, yes, sir.

Q Thanks, Mr. Shattuck.

MR. NOLAN: Mr. Chairman, if I might ask, what is Exhibit 116? I have 115, being Annual Report of the Northern Gas Company.

MR. STEER: They were contracts which Mr. Martland put in at the very end, of which we did not get copies.

MR. PORTER: The gentleman who prepared this material in Mr. Harries' office is here. I think perhaps we could take him now. It is just a technical proof of it. This was put in for identification but is marked as Exhibit 83.

NORMAN A. RAULT, having been first duly sworn, examined by Mr. Porter, testified as follows:

Q Mr. Rault, you are associated with Mr. Hu Harries?

A That is right, sir.

Q In carrying on work as a consulting economist in Edmonton?

A That is right.

Norman A. Rault,
Dir. Ex. by Mr. Porter.
Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3162 -

Q Can you tell us your educational qualifications?

A Well, I graduated in 1949 from the University of Alberta. I am a Bachelor of Commerce. I went to work for the Province of Alberta in the Department of Economic Affairs for two and a half years in the gathering and compilation of statistics and other information on the Province of Alberta, and I became associated with Mr. Harries two months ago.

Q And you worked with Mr. Harries in the preparation of this material?

A That is right, sir.

MR. PORTER: I doubt if there is any need in taking up the Board's time going through it. It is self-explanatory.

Q The information for this came largely from the earlier study, population study, that Mr. Harries had done for this Hearing?

A To some extent.

Q And you localized and intensified that?

A That is right, sir.

Q I could have the witness read it, if you like, but it seems to me that the reference is readily available. That is all, unless other counsel have some questions.

EVERETT G. TROSTEL, recalled,
already sworn, examined by Mr. Porter, testified as follows:

MR. PORTER: At the close of Mr. Trostel's evidence earlier in the Hearing the Board intimated that it might be helpful if a study were made to show how the now available gas might be made to serve both the needs of the Province of Alberta and the demands of the Trans-

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3163 -

Canada system. This, Mr. Trostel has done, and desires now to submit it.

SUBMISSION BY EVERETT G.
TROSTEL, "ILLUSTRATIVE
DELIVERABILITY SCHEDULES",
PUT IN AND MARKED EXHIBIT 118.

MR. PORTER: There are a few more of these at my office. They will come up later. Unless there is a shortage at the moment I can send for them. I promised Mr. Brokaw one but I have not been back to the office.

Q Mr. Trostel, you are under oath, and we qualified you the last time you testified?

A Yes, sir.

Q So that you may now proceed to testify from your exhibit.

A Well, I believe Mr. Porter has just explained the purpose of the preparation of this exhibit. This exhibit was prepared to reduce to a field-by-field analysis to make illustrative deliverability schedules based on the data previously placed in the record in order to make something more concrete in nature than the general statistical treatment which we presented, I believe, as Exhibit 23 a month or two ago. If it is all right I should like to read the text of this report. I believe it is fairly straightforward. The Exhibit is entitled, "Illustrative Deliverability Schedules for Estimated Future Production of Natural Gas, Province of Alberta, Canada, as of January 1st, 1951."

Scope of
Investigation

This report presents a series of illustrative deliverability schedules detailing a practicable method for the future production of natural gas from certain of the presently known fields

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3164 -

in the Province of Alberta, Canada. This study was made to comply with the requests made in your letter of October 5, 1951, and with the recommendations outlined in the enclosure therewith.

This report is addressed to Trans-Canada and the letter to which reference has just been made has been included in the report, following page 9. They are letter of authority with enclosure. As those letters are basic to our work, I should like to read them, if I might, at this time. Referring first to the enclosure, the second page following page 9:

PORTER, ALLEN & MacKIMMIE

Barristers, Solicitors
Notaries

436 Lougheed Building,
CALGARY, Alberta,
October 4, 1951.

F. A. Schultz, Esq.,
Trans-Canada Pipe Lines Limited,
1004 Barron Building,
Calgary, Alberta.

Dear Sir:

The pending application of Trans-Canada and Delhi for a permit to remove gas from the Province of Alberta for sale elsewhere in Canada is being made under the Gas Resources Preservation Act of Alberta. That Act designates in Section 3 that - "the intent, purpose and object of this Act is to effect the preservation and conservation of oil and gas reserves of the Province of Alberta and to provide for their effective utilization having regard to the present and future needs of the residents of the Province".

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3165 -

At the conclusion of the sessions on the 25th day of September, 1951, the Board intimated a desire to have Mr. Trostel design for the Board's information an illustrative programme which, in the light of Trans-Canada's application, would provide for the "effective utilization of the Province's gas resources having regard to the present and future needs of the residents of the Province".

The Board, in its interim report, has fixed an estimate of the needs of the Province for the next thirty years. Hu Harries by another study, in testifying before the Board since that time, has estimated like needs only slightly in excess of the Board's figure. The Board's figures therefore seem sound. So far, however, the findings deal only with the quantities necessary to serve the Province but do not touch local prices as they may be affected by export demand.

Will you instruct Mr. Trostel and Mr. Warterfield to evolve a transmission and deliverability programme to serve both the needs of the Province and Trans-Canada's export requirements on a basis that will make gas available to the Albertans now served by existing utilities and to be served by them and all other facilities in the future on a basis that will minimize local transmission costs, provide the greatest flexibility of supply, and minimize the impact of export demand upon prices for Alberta's needs as far as possible. The Board must be concerned with both quantities and price if it is to "have regard to the needs of Alberta".

To accomplish this Trans-Canada's transmission

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3166 -

lines should:

1. Be designed to tie into local distribution systems now existing.
2. Follow a route calculated to serve as many Albertans not now served as is economically feasible within the limits of the programme.
3. Make provision for gas storage if feasible so as to avoid waste and meet peaks.
4. Facilitate the use of gas produced with oil that might otherwise be wasted if confined to local use on low load factor lines.
5. Provide for the exchange of gas on a foot for foot basis so as to minimize transmission costs to Alberta users.

Arising out of the last of these proposals it is my suggestion, as we have previously discussed, that we should propose to the Board that consideration should be given to the use of gas in Crown owned lands for the benefit of local use as a factor in reducing gas costs of Albertans. The Government of the Province of Alberta, as you know, has a Crown reserve policy under which one half of the lands taken under reservation revert to the Province. A reservation holder is entitled to take a lease of the lands within the reservation in blocks not larger than 3 x 3 or 2 x 4 miles. It follows inevitably that in the large prairie gas reservoirs, similar to Cessford, Kinsella or Pakowki Lake, discovered in the future the Crown is likely to become the owner of substantial areas lying within its reserves but outside the areas selected and leased by reservation holders.

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3167 -

The development of the leased portions of the reserves will, as indicated at Kinsella and Pakowki Lake, prove the existence of gas reserves on adjacent Crown lands so that there will be a minimum of risk involved in their development. If these gas lands are leased by the Government, it may get a premium on the balance of the reservation although this has not happened yet. However, it will take only a royalty on the gas if found and produced. The maximum benefit to the Government, therefore will be a premium, if any, and the royalty. Together they constitute the sum total of the money that the Government will get out of these gas reserves. If the Government could be induced to dedicate all such gas reserves to Alberta's needs it will be seen that Albertans will only need to pay for this gas a purchase price equivalent to the royalty that would have been collected by the Government if the gas were leased, plus, of course, whatever sum per 1000 feet the premium would represent. The consumers in Alberta could therefore expect for the foreseeable future to purchase a substantial quantity of their needs out of Crown reserves and pay for that gas a price of $1\frac{1}{4}\text{¢}$ to $1\frac{1}{2}\text{¢}$ per thousand without impairing Government revenue. The extent of these areas that will become available will depend on the Government's future policy with respect to gas licenses.

These reserves would have to be developed in order to serve the market. I suggest that Trans-Canada, which will be a utility company functioning under a fixed rate of return, should obligate itself to develop these reserves at cost, carrying the expenditures for this

Evertt G. Trostel,
Dir. Ex. by Mr. Porter.

- 3168 -

purpose into its rate base. In the result Crown reserve gas will be made available to Alberta consumers in the field at a price of $1\frac{1}{4}\phi$ to $1\frac{1}{2}\phi$ and so far as prairie structures are concerned something in the vicinity of 2ϕ for development, making a price for domestic consumption of $3\frac{1}{2}\phi$ or at the most 4ϕ in the field.

The geographical location of this gas need not affect its price inasmuch as it could be used for exchange through Trans-Canada for gas attached to its system in areas located as close as possible to the point of use locally. This will of course minimize transportation cost to local consumers.

Wherever gas is transported through Trans-Canada's system for delivery to the local utilities, Trans-Canada should agree that the transmission charge for the service to the local consumer or utility will be on a unit basis ascertained on a line total through-put basis. By this means the benefit of the high-load factor of Trans-Canada's lines will be available to minimize transmission costs to local users.

This programme will leave presently connected fields to supply local markets and make instantly available to serve any local deficiencies all of the gas to which Trans-Canada is connected. It will minimize transmission costs into local markets by giving them the benefit of Trans-Canada's high-load factor. It will take gas recovered with oil to use as it is produced and yet make its price benefits available to local markets under the gas exchange programme. It will give local facilities a first call on all of the gas connected or inter-connected at

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3169 -

their present sources of supply and at Trans-Canada sources. It will minimize the danger of price increases resulting from export demand and may even reduce domestic prices if a sufficient volume of Crown reserve gas becomes available.

The last mentioned items affecting the price of gas and transmission are not items with which Mr. Trostel will be asked to deal but they should be brought to his attention so that in considering physical problems which he is asked to meet he will understand the objective which we are seeking.

Yours truly,

"M. M. PORTER"

M. M. Porter.

(Go to page 3170)

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3170 -

Q MR. C. E. SMITH: Is that the gentleman sitting at the table, Mr. Trostel?

A Yes.

MR. PORTER: The same.

MR. C. E. SMITH: I wondered why he was not up there reading it.

A Just because we included in our report the letter of authority. I would like now to refer to the letter immediately following page ix, the letter of authority with enclosure. It is a letter from Mr. Frank A. Schultz, Vice-President of Trans-Canada Pipe Lines Ltd., under date of October 5, 1951.

"Dear Mr. Trostel:

In line with our previous discussion concerning the request of the Board for a practical method to supply the needs of the Province of Alberta from known reserves as discussed in the Board's Interim Report, will you please proceed with your studies in an effort to arrive at an illustrative practical solution to the problems involved.

Enclosed with this letter you will find a letter from Mr. M. M. Porter to me setting out in detail the problems involved and the general approach we have in mind. If Trans-Canada is successful in obtaining an export permit pursuant to its application it will be the policy of the company to develop crown reserves as outlined in Mr. Porter's letter, if such crown reserves are made available.

Please prepare the results of your

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3171 -

"studies and report in the form of an Exhibit
which may be presented to the Board along with
your testimony at a later date.

Yours very truly,
TRANS-CANADA PIPE LINES LTD.

"Frank A. Schultz"

Frank A. Schultz,
Vice-President.

"

I should like now to return to
the first page of the report under "Scope of Investi-
gation", and I continue with the second sentence of the
first paragraph.

In particular, our study, there-
fore, had the following basic objectives:

1. To develop practicable but illus-
trative deliverability schedules to meet the estimated
future requirements of the Alberta utility systems over
a period of 30 years, commencing with the year 1951.

2. To develop such deliverability
schedules in conjunction with the proposed operations of
Trans-Canada Pipe Lines Limited, hereinafter referred to
as "Trans-Canada", in such a manner that physical waste of
natural gas be reduced to a practical minimum.

3. To develop practicable but illus-
trative deliverability schedules for the proposed operations
of Trans-Canada so that, first, any deficiencies of the
Alberta utility systems may be supplied at minimum cost,
and second, that the pipe-line requirements of Trans-Canada

E. G. Trostel,
Dir, Ex. by Mr. Porter

- 3172 -

be satisfied.

Authority

This report was made at the request of Mr. Frank A. Schultz, Vice-President of Trans-Canada Pipe Lines Limited.

Source of Information

Data used in the preparation of this report were obtained principally from our reports Volumes I, II, III, and IV, - I might interpolate that these reports are in the record under Exhibits Numbers 4, 4A, 10 and 23 -; from Canadian Delhi Oil Limited; from the Interim Report of The Petroleum and Natural Gas Conservation Board, Province of Alberta, and from data on file with and from testimony presented before the Board in various hearings; and from our own files. Mr. Floyd K. Beach, Consultant, and Mr. Smiley Raborn, Jr., of Canadian Delhi Oil Limited were invaluable in obtaining basic engineering test data from certain persons and companies as previously acknowledged in our reports.

Estimation of Future Deliverability

Studies made in detail on individual reservoirs and on fields, occasionally in groups of small fields, were included in our reports Volumes I, II, III, and IV. These investigations were based on reserve estimates as of January 1, 1951, but reflected available data as of August 1, 1951. For this study the reserves of certain fields were revised as of January 1, 1951, to reflect available data as of November 15, 1951. Total proved and probable

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3173 -

reserves available for sale for the fields in which
revisions have been made are shown in the following table:

<u>Field and Reservoir</u>	<u>Reserves Available for Sale (MMcf)</u>		
	<u>As of Aug.1, 1951</u>	<u>As of Nov.15,1951</u>	<u>Factor</u>
CESSFORD			
Lower Cretaceous	334,558	793,937	2.373

I would like to say at this time
that we have since revised the Cessford reserves following
the completion of the last three wells. This took place
within the last two days, or three days, as of December 12th,
1951, and our estimate for Cessford reserves available for
sale from the Lower Cretaceous now totals 873,157 million
cubic feet.

Viking	88,577	118,579	1.339
COUNTESS	125,388	95,525	0.761
PEACE RIVER AREA			
Whitelaw	556,721	556,721	
North Tangent	<u>28,423</u>	<u>178,060</u>	
Total	585,144	734,781	1.256

The effect of the revised reserves on deliverability was
expressed by application of the factor above derived to the
previously calculated average daily rate of production
and cumulative net production for each respective field.

Projections of dissolved gas pro-
duction were made in previous reports for the Rundle Limestone
of the Turner Valley field and for the Leduc (D₃) Dolomite
of the Leduc-Woodbend field and for this study in addition
a projection was made of estimated future dissolved gas
production for the Leduc (D₂) reservoir.

E.G. Trostel,
Dir.Ex. by Mr. Porter.

- 3174 -

A general discussion of the method of estimating future performance of free gas and dissolved gas reserves has been included in our previous reports. The projections developed in our previous reports have been used for calculating the deliverability schedules presented herein with the exception that the estimates of The Petroleum and Natural Gas Conservation Board were utilized for the Jumping Pound field and the peak-day performance of the Bow Island gas storage project.

Discussion of Deliverability Schedules.

The daily average and peak-day requirements of the two major utility systems in the Province of Alberta have been estimated by The Petroleum and Natural Gas Conservation Board for a period of thirty years, commencing with the year of 1951. Illustrative deliverability schedules have been developed herein, based on assumptions considered to be reasonable and practical, to meet such requirements from the estimated future production of presently known gas reserves. However, it is pointed out that these schedules should be considered only as illustrative, and subject to considerable variation in the inter-relation of production from one field with another. These illustrative deliverability schedules for the utility systems do not take into account additional amounts of gas which will become available to them during the next thirty years. Unquestionably, the natural gas supplies in Alberta will be increased, and substantially, by future exploration, and, accordingly, so will the supplies of gas available to the utility systems.

E.G.Trostel,
Dir. Ex. by Mr. Porter

- 3175 -

General procedure followed in meeting the requirements of the utility systems has been first, to supply such requirements from their presently connected fields; secondly, to augment the supply as needed from presently known but unconnected fields adjacent to the utility systems; and finally, as necessity develops, to supply additional gas both as to volume and peak-day requirements from the proposed facilities of Trans-Canada.

To assist in meeting the peak-day demand of the Northwestern Utility System in 1967 and subsequent years, Trans-Canada proposes to convert the Picardville field to a gas storage project capable of supplying gas to Northwestern at a peak-day rate in excess of 60 million cubic feet. It is anticipated, through mutually co-operative effort on the part of Trans-Canada and Northwestern, that gas exchange can be effectuated so that Northwestern may have the advantage of high peak-day volumes from the Picardville gas storage project without a substantial increase in the cost of gas.

It will be noted that the illustrative deliverability schedule for the Northwestern system plans for increasing gas production from the Leduc field with its complete utilization by the Northwestern system. Although complete utilization is statistically feasible on an average daily and peak-day basis, it is expected that Leduc total production during the summer months of minimum utility demand may well exceed such demand. This condition would normally result in physical waste of such excess gas and loss of income to the producer. However, the

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3176 -

proposed facilities of Trans-Canada are so located that Trans-Canada can and will accept delivery of all of such excess gas, thereby preventing its waste and providing a market for its sale.

An illustrative deliverability schedule for the proposed operations of Trans-Canada has been developed on the basis of meeting its requirements for as long a period as possible after giving first consideration to meeting the requirements of the Province. Trans-Canada requirements are those based on initial design capacity and proposed operations, except that sufficient gas has been provided to operate the line at increasing load factors until 100 per cent load factor has been reached in 1963 and maintained thereafter for as long as possible.

Illustrative deliverability schedules are detailed in the tabular section of this report for the Canadian Western Gas Company system, for the Northwestern Utility Company system, and for Trans-Canada, with supporting schedules for certain fields. Accompanying each deliverability schedule are explanatory notes furnishing the source, by columns, of the data appearing in each schedule.

I should now like to discuss. . .

Q DR. GOVIER: There is another half page, I think, Mr. Trostel?

A Yes, sir.

Q Were you going to read it?

A If you would like, I will read it now. I thought perhaps I would discuss the schedules and then tie them together with the summary.

E. G. Trostel,
Dir. Ex. by Mr. Porter

- 3177 -

Q Oh, excuse me.

A But it, perhaps, would be better to read it now, if you would like me to.

Q I am sorry, Mr. Trostel, I just thought you had forgotten it.

A Summary and Conclusion

This report presents -illustrative deliverability schedules, detailing a practicable method for meeting from presently known reserves of natural gas, the future requirements as estimated by The Petroleum and Natural Gas Conservation Board of the Canadian Western Gas Company and The Northwestern Utility Company for a period of thirty years commencing with the year of 1951.

An illustrative deliverability schedule for Trans-Canada is presented which details a method by which the requirements of Trans-Canada on a 100 per cent load factor may be met for a period of nearly nineteen years subsequent to the end of the construction period. It is estimated that the requirements of Trans-Canada can be met for a period in excess of nineteen years at 90 per cent load factor or for a full period of twenty years at 85 per cent load factor.

Submitted,

DeGolyer and MacNaughton

DeGOLYER and MacNAUGHTON

November 24, 1951.

I should now like to turn to the tabular section of the Report, to page 2 and page 1-B,

E. G. Trostel,
Dir. Ex. by Mr. Porter

- 3178 -

Table 1, which is an illustrative deliverability schedule for the Canadian Western Natural Gas Company distribution system, Province of Alberta, Canada.

The general set-up of this schedule, and other schedules which follow of this nature, is to start with the requirements of the Board, the estimated requirements of the Board, as delineated in their Report, which, in the case of Table 1, represents columns 2, 3 and 4. As the schedule is developed we have attempted to set up on the opposite page to the left, in this case page 1-B, notes referring to each Table, giving the derivation of the data from which the columns have been developed.

As previously mentioned in the text of the Report, with the exception of changes which we have made in adjustment in the Cessford Field, in Countess and in North Tangent, and except for the addition of a study of deliverability of gas from the Leduc-D-2 horizon, and, in addition, the utilization of the Conservation Board's estimate for the performance of Jumping Pound, and the peak-day performance of Bow Island, all of the figures in this schedule and the schedules to follow, are based entirely on data previously in the record.

I believe I mentioned when I testified in regard to Exhibit 23, that Exhibit 23 and the deliverability schedules, which were also located in Volumes 1, 2 and 3, merely constituted a framework within which it was possible to calculate rather laboriously, but it is definitely possible to calculate any combination of these fields taken in any manner which you desired in order to arrive at an

E.G.Trostel,
Dir. Ex. by Mr. Porter.

- 3179 -

answer of how a group of fields can be fitted to a particular demand. That is the system which we have followed. It is the same system on these derivations that was presented in the statistical summary, Exhibit 25 and Exhibit 25A. These derivations to which I refer are based on the method developed in the presentation of those schedules. The method of relating average daily rate with cumulative production for a field or for a group of fields. I believe the method actually was put into the record in my discussion.

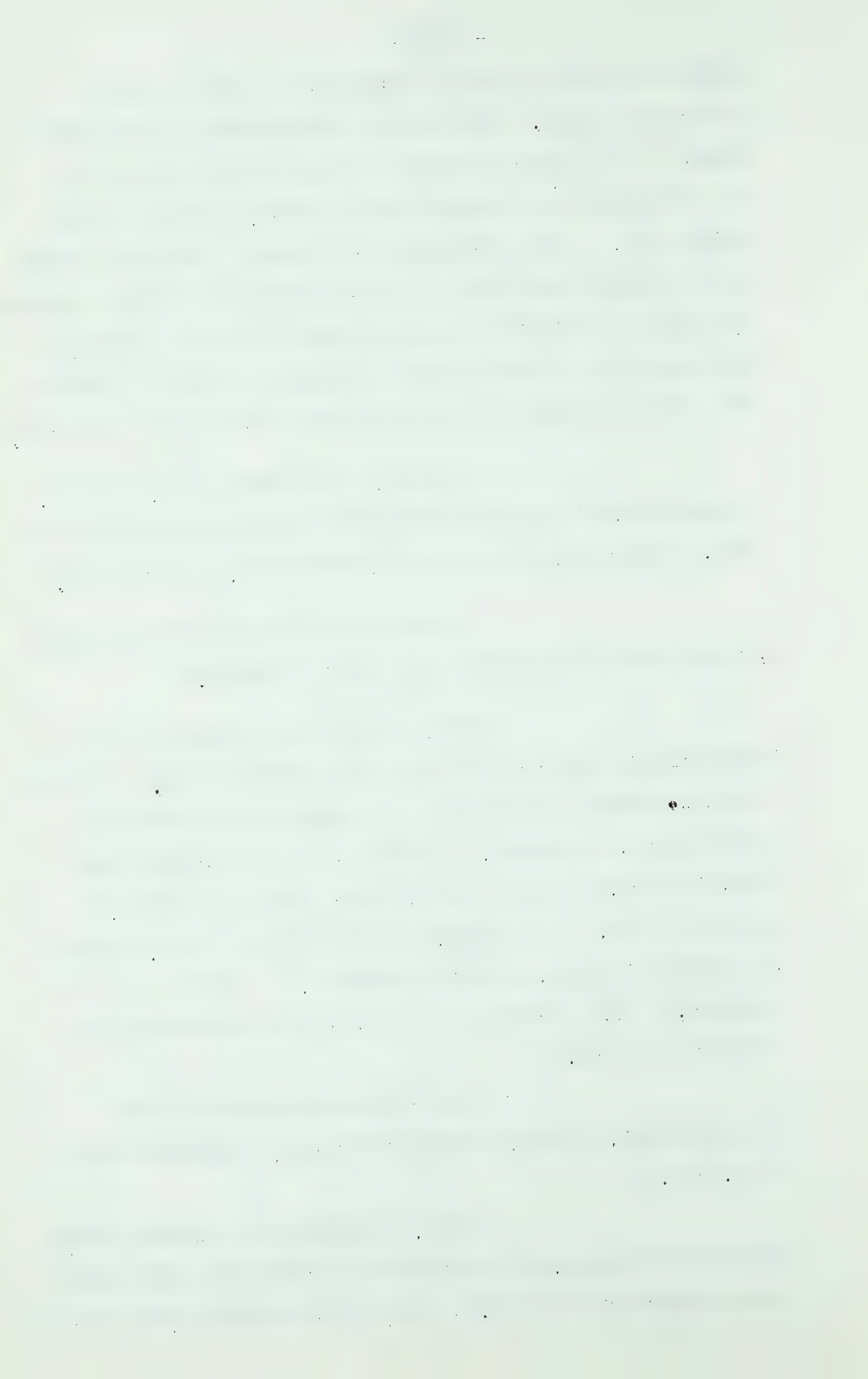
However, an example of it, perhaps, I should say, is represented by the over-all deliverability chart, Exhibit 25, and the supporting Table, Exhibit 25-A.

I should now like to return to Table 1, and show how that Table has been integrated.

First, we made an estimate of the fields immediately connected to the utility system. Turner Valley, we made the estimate in columns 5 and 6 for the dissolved gas, columns 7, 8 and 9 for the associated gas. These, in turn, can be referred for source to page 1-B, columns 5 and 6, for example, derived from column 2, page 3, Census Division 4, Exhibit Number 10, Volume 3 of the September, 1951, Hearing of the Petroleum and Natural Gas Conservation Board.

7 and 8 then were derived from columns 2 and 5, page 2, Census Division 4, Exhibit Number 10, op. cit.

Column 9, referring to Turner Valley, 1951 to 1963 figures, are limited by estimated total field plant capacity of 100 MMcf. per day of residual gas, which is



E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3180 -

the equivalent of column 6 plus column 9, equals 100.
From 1964 through 1980, the figures derived from column
10, page 2, Census Division 4, Exhibit Number 10, op.
cit.

(Go to page 3181)

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3181 -

Proceeding, then, with columns 10, 11 and 12 we decided that it would be better to use the deliverability data which had been developed by the Conservation Board. I believe it was brought out in my previous testimony here that we experienced extreme difficulty in obtaining reliable data on the Jumping Pound field and although we were successful in obtaining some additional information shortly after or about the time this report was prepared, we did not have the time to make a study of the Jumping Pound field in detail at that time. We therefore considered that the Board's estimate would be better than any we could make ourselves, but that does not mean we used the figures year by year developed by the Board in the Interim Report. What it does mean is, following the system which I have mentioned before we took the Board's estimate and plotted the average daily and also the accumulated production and taking that curve we then set out the data as shown in Tables 10, 11 and 12, the peak day volume, less than peak day and up to peak day volume, which the Board assigned to the field. It was not possible to meet the requirements, the steadily increasing requirements of the Canadian Western Natural Gas Company system solely from this field and the other fields to which they are now connected. I understand in the Pakowki Lake area or the Foremost field, that is the entire northern part of the Foremost field, which is part of the Pakowki Lake area, has been connected to the Utilities' system and also that is the same general area from which it has been proposed that gas be transmitted on an export basis from Canada to Montana for a five-year period. It appeared to us that this

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3182 -

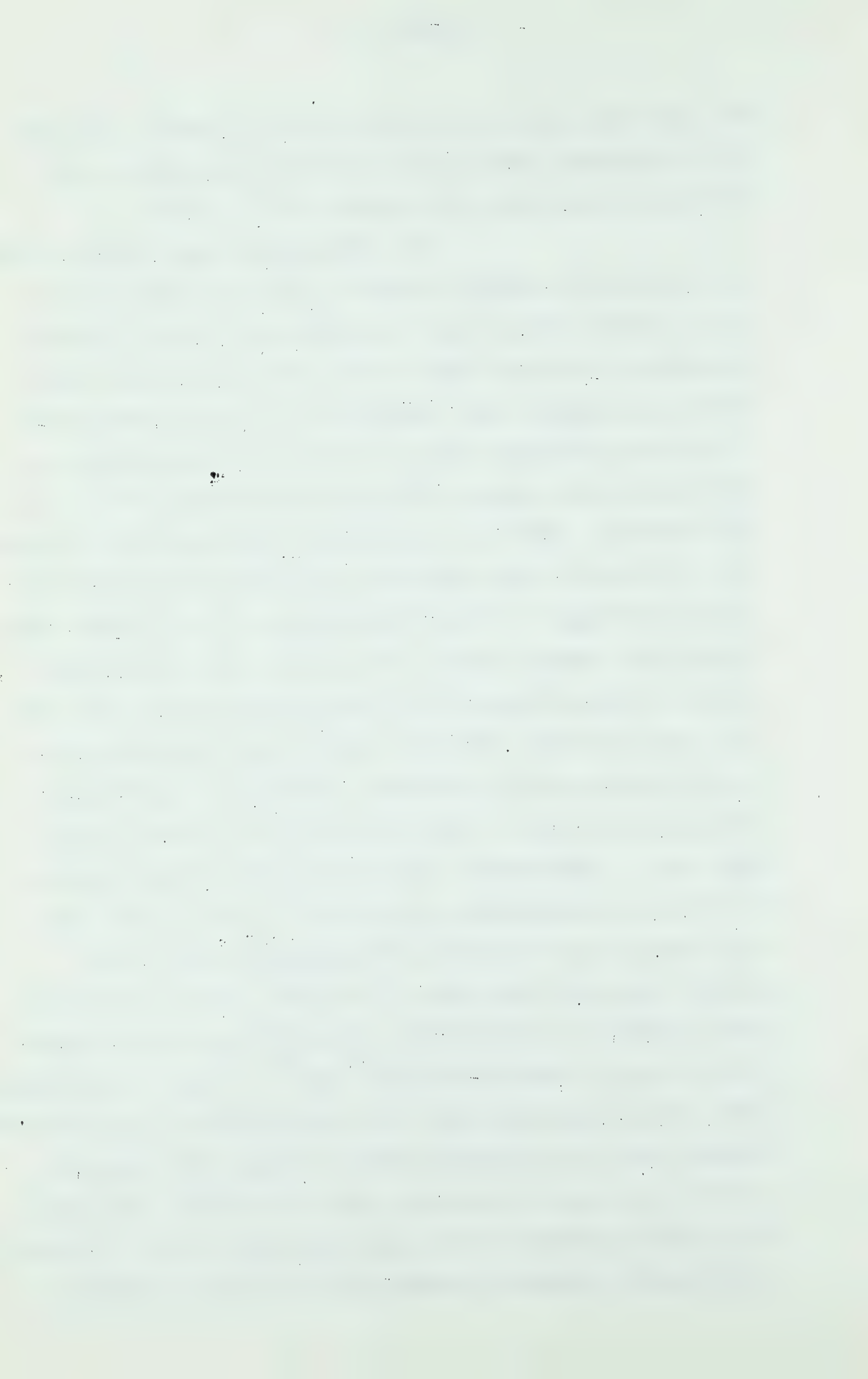
would be the most reasonable source of gas for the Canadian Western Natural Gas Company's system , inasmuch as it was immediately adjacent to its distribution system and for gas presently known in large volume and with a good state of deliverability, it seemed to us a most likely candidate to be connected to the Canadian Western Natural Gas Company's system. I may say again this is a very flexible proposal. We have not consulted with the Gas Company in any manner in assigning this field to it. It might not like it. But we are charged with making a 30-years' projection and that seemed to be the most reasonable and practicable source of gas supply for the Canadian Western Natural Gas system. It might well be that other fields, and more desirable fields, will be discovered than the Pakowki Lake area, from which heavy withdrawals might be made without going to far afield from the system. That is the basis for our reluctance previously of assigning to them that gas from this field, but we simply state that that is a reasonable source of supply, which we developed from the data as indicated and in columns 13, 14, 15 and 16 for the Pakowki Lake area. We did throw in a little Chin Coulee field in this. It is quite adjacent to the Utilities' system line, although it is a very minor amount of gas relative to the entire Pakowki Lake area. Now, on page 1 also are the references which show the source of the derivation of these columns previously referred to, 13, 14, 15 and 16. Then the Bow Island field is currently used as a gas storage project and we show in column 17 the past performance figures as shown by the Petroleum and Natural Gas Conservation Board in its Interim Report. We do not accept

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3183 -

the peak day volume shown in the Board's report. I am sure if the need were large, additional drilling might provide even greater peak-day performances for the field.

Now, these particular fields are the ones which more logically could be connected with the Canadian Western system, plus the Pakowki Lake area. However, in making a 30-years' study of the deliverability of these fields, according to our calculations there is insufficient to provide sufficient volume of gas to meet the utility requirements after the year 1969, and accordingly in the year 1970 through 1980 it is proposed in this schedule, columns 18, 19, 20 and 21, that gas from the Pincher Creek field be diverted through the Trans-Canada system to the Canadian Western Natural Gas Company system. The lines of the Trans-Canada and the Canadian Western Gas Company systems will cross, and, as a matter of fact, probably should to get additional line capacity which will be necessary, inasmuch as the Pincher Creek gas will tend to make up the decline in the Pakowki Lake area. Now this was only to make gas available to the Province as inexpensively as possible and we can only say and point to the statements of Mr. Schultz, which I have already read, and the letter of authority that if gas can be made available to Trans-Canada from gas reserves as proposed by Mr. Porter, Trans-Canada will divert such gas in accordance with their proposal and make such gas available to the Utilities' system, that is the Canadian Western Natural Gas Company's system, at prices in accordance with the schedule and those two letters to which we have made reference. That, of course, will require the mutual co-operation of effort as between



E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3184 -

Trans-Canada and the Utilities' system, but as engineers we do not see any reason why that could not be worked out.

Returning again to Table 1, and diverting the gas as shown from the Trans-Canada system from Pincher Creek to the Canadian Western Natural Gas Company's system in the volume shown, we then arrive at a summation of the gas which can be delivered to the Canadian Western Natural Gas Company system, columns 22, 23 and 24, which are identical with the Board's estimated requirement in column 31. In other words, this proposed schedule is illustrative and flexible. Nevertheless, it is one which shows the way in which we can supply the demands of the Province as reflected by the Canadian Western Natural Gas Company system and can be made for the full 30-year period starting with the year 1951.

I should now like to turn to the table located, Table 2 located on page 4. This table in effect is a back-up table for columns 18, 19, 20 and 21 of Table 1, and is a deliverability schedule for the Pincher Creek field calculated for a 30-year period. Columns 7, 8, 9 and 10, estimated total deliverability figures for the field, have been derived exactly from our previous testimony and grouping columns 2 and 3 and columns 4, 5, and 6, merely represents the supply or the total deliverability, first to Trans-Canada, of the entire amount to be produced from the field, starting in the year 1953 through 69 and from 1970 and thereafter the production from Pincher Creek to be split between Trans-Canada for export and Trans-Canada for trans-shipment to the Canadian Western system. Columns 4, 5 and 6

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3185 -

of Table 2 are identically the same columns as 18, 19 and 20 of Table 1. Perhaps I should point out the present well head open flow that we take from the Pincher Creek from 1976 through 1980, when the field is well down in its life, in order to meet these peak demands of the utility system, we increase the present well head open flow under peak day conditions from 35.7% in 1976 to a high of 61.2% in 1980. We do not anticipate that any damage will result to the field in that stage of depletion some 30 years from now.

I would now like to turn to Table 3 appearing on page 6 and the accompanying back-up page 5(B). Table 3 is entitled "Illustrative Deliverability Schedule for the Northwestern Utility Company distribution system. Similar to the first table, columns 2, 3 and 4 represent the estimated requirements of the Northwestern Utility Company for a 30-year period, starting in 1951 and ending in 1980, these estimates being identical with the figures estimated by the Board in its Interim Report. Following the previous system, page 5(b) provides the references, column by column, of the data derived in the main portion of the table. This table probably will require somewhat more explanation than the previous table. However, I should like to run through the implications of the table first and then present the supporting data to back up the table immediately thereafter. The Viking-Kinsella field, of course, is the main source of supply for the Northwestern Utilities Company, and it continues to be the main source of supply as estimated in this deliverability schedule, columns 5, 6, 7 and 8. In addition, we understand that the Northwestern

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3186-

is connected to the Leduc plant. We have made a study and estimated the future gas production from the Leduc plant and anticipate when this gas will be taken by the Northwest system. As a matter of fact it might have been better to put the Leduc plant ahead of the Viking-Kinsella field in the table, because we have followed the system of taking all the gas from Leduc that was possible, in order to prevent the waste of any gas that is produced with oil, and then balancing the load with Viking-Kinsella. We found from quite a few trial runs that it was desirable that the Golden Spike field be put on production before too many years have gone by, in order to meet the 30-year demand picture. It seemed to us that this was a likely field for the utility companies' system to connect to. It is only a relatively short distance from the Leduc field and while again we have no reason to think that the utility company might agree with our selection of this field, nevertheless it seemed a logical choice because it could be made available to this system at a minimum of cost. Hence, we have brought it into the picture starting with the year 1954. The figures for Golden Spike are developed from our previous testimony in regard to rate of take. We found that by testing these fields with our estimate for production from Leduc, that the requirements of the Conservation Board might be met from these three fields until 1973, at which time we find, according to our calculation, that these fields are no longer sufficient to provide for the market demands estimated for the Northwestern Utility Company, and similar to the procedure which we followed in assigning the gas from the Pincher Creek field from the Trans-Canada

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3187 -

system to the Canadian Western Natural Gas Company system
we now are assigning gas from the Trans-Canada system from
the Whitelaw-North Tangent area in order to make up the
deficiency, which, according to our calculations, develops
in the Northwest Utilities Company program starting in
1973. The rate of take increases gradually over the sub-
sequent period of 8 years, and in 1980, according to our
estimate, is taking some 35 million a day from that **field**.

(Go to page 3188.)

Everett G. Trostel;
Dir. Ex. by Mr. Porter.

- 3188 -

A I might also say that the Whitelaw-North Tangent field is also used for meeting the peak day demands. In fact, it is just as essential to meet peak day demands as it is to meet the average daily take. However, in spite of the connection of Whitelaw and North Tangent there is still a question of peak day performance which we found we were unable to meet from existing gas reserves known, as we estimate them, without the provision of some type of storage project to serve the Northern system similar to the effect of Bow Island, which is now in effect in serving the Canadian Western system. We discussed this problem with our client. Mr. Schultz of Trans-Canada told us to go ahead and plan a conversion of the Picardville field, the majority of which is owned, we understand, by Canadian Delhi, into a gas storage project so that this gas could be available to meet the peak day demands of the Northwestern Utility Company's system. It may well be before that time that Northwestern Utility Company will have ample gas from other sources not now known, or it may perhaps wish to work out a storage system of its own. However, our calculations show from what we know of the performance of these fields a gas storage project or additional sources, as estimated by the Board, certainly will become necessary when you have to make at the present time a 30-year prognostication for that system and we have made such a calculation for the Picardville field and converted it to a gas storage project, and, as shown in column 20 of Table 3, starting in 1969 the Picardville field is set up to deliver first 10 million a day for peak peaking increasing to 50 million in 1974, 50.8 in 1954 and eventually to 60 million. Perhaps

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3189 -

I should go back and pick this up now. On peak day we have considered it reasonable under peak day conditions to overload the plant at Leduc by 25 per cent. That is based on our experience and we find normally that a well-designed plant is able, without too great a loss in efficiency, to operate at 125 per cent load factor, if you like, for peaking purposes.

But to return again to the Picardville storage and again to Whitelaw and North Tangent, it is our understanding that through cooperation between Trans-Canada and Northwestern Utility that it should be possible, certainly in the case of Picardville, to arrange for an exchange of gas on an Mcf. basis, not a dollar transaction at all, so that during the summertime gas which normally would go to Northwestern Utility Company can be diverted into the Trans-Canada system for export, and simultaneously a like amount of gas would go from the Peace River or through the Trans-Canada line and can be used to fill the Picardville storage project. There is no reason why that can not be done definitely on a per Mcf. exchange basis, and consequently the cost, the high priced cost of a storage project, can be avoided, the long distance transportation, and as a consequence the price of this peak day gas minimized. We anticipate that if arrangements can be made as previously discussed for Trans-Canada to possibly develop Crown acreage gas and make it available at its cost plus operating cost, that then this gas from the Whitelaw-North Tangent field which goes into the Northwestern Utility Company's system, of course, it would be high priced gas to Trans-Canada, an exchange could be made

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3190 -

and Trans-Canada through Mr. Schultz has indicated his willingness to do that. Here again, an exchange of gas can be made to minimize the price of gas to the Utility system which would come from the Northwestern line.

In summary for Table 3, columns 21, 22 and 23 represent a summation of the columns before and are identical as the columns 2, 3 and 4, with the exception that sometimes our averaging changed 1/10 of a point. By and large they are identically the same figures. The daily averages are the same but sometimes the annuals do not add up across.

THE CHAIRMAN: I think this might be an opportune time for an adjournment.

MR. PORTER: Yes, I agree.

(The Hearing then took a short adjournment.)

E.G.Trostel,
Dir. Ex. by Mr. Porter

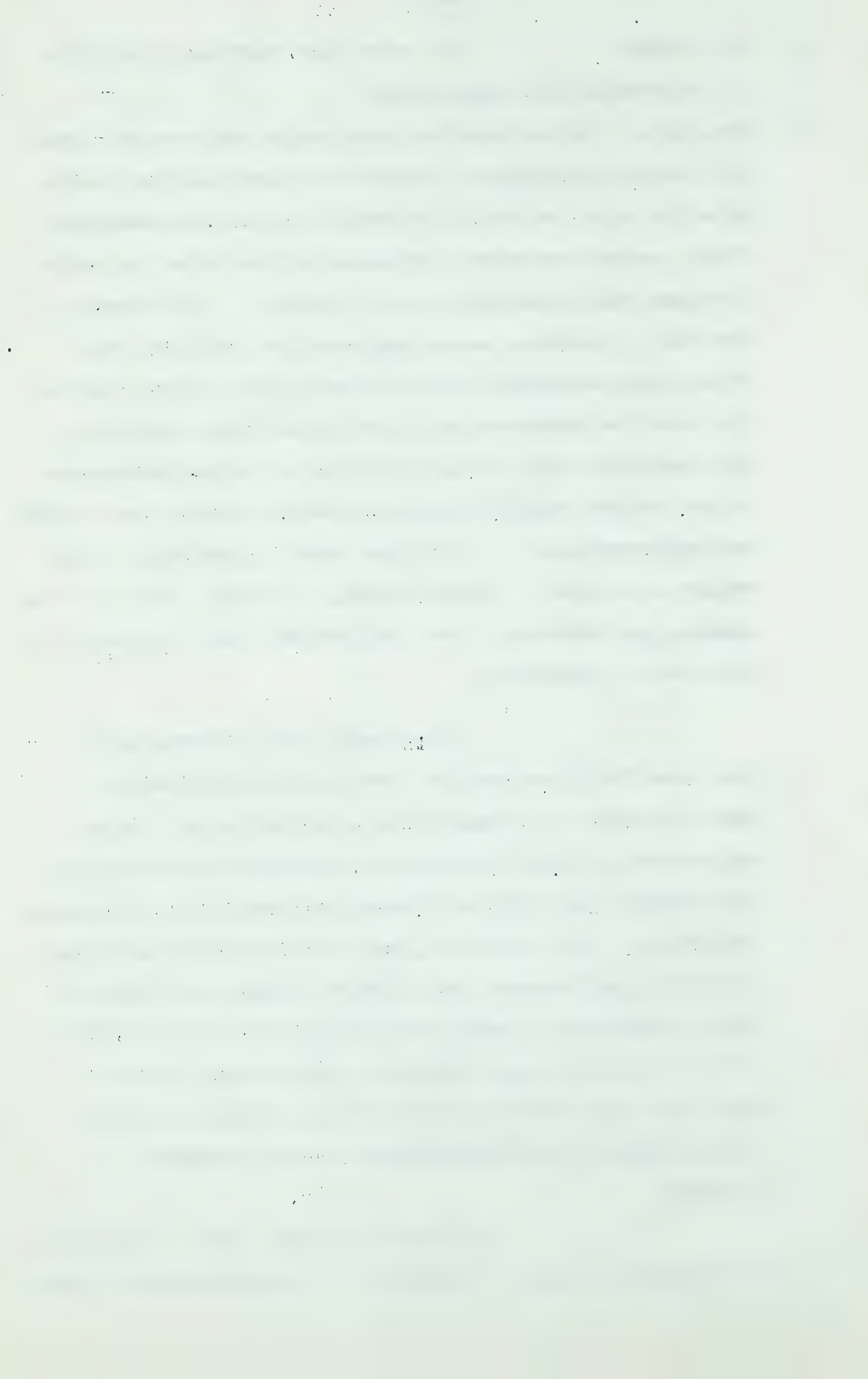
- 3191 -

Q MR. PORTER: You were just starting this Table 4, Mr.Trostel, the Leduc study?

A Yes, sir. In our previous work, which has been put into the record, although we estimated the gas reserves available for sale for the D-2 reservoir in the Leduc-Woodbend Field, we had not made an estimate of the rates at which that gas will be produced in the future. The reason for that, I believe, as we explained at the time, that we had only estimated solution gas in two fields, that is, the Leduc D-3 reservoir and the Turner Valley reservoir, the reason for that being a question of economics whether or not the gas would be gathered in the solution gas fields and made available. We figure that is, perhaps, in the nature of a plus. Trans-Canada, of course, would pick up solution gas wherever it was gathered and made available in its area of operations.

In reviewing the performance of the Leduc Field, we decided very rapidly that we had made a mistake in not including a projection of the D-2 gas reserves, since the Leduc D-2 reservoir is developing very rapidly, and the D-2 production already is of sizeable proportions. We, therefore, made quite an elaborate study of the D-2 performance. As a matter of fact, our study of the D-2 reservoir is still continuing at the present time. I do not know how much detail it will be worth to put into the record now as to the method. However, I think I should give a brief description of the procedure followed.

As far as we know, the D-2 reservoir is a depletion type of reservoir. Its performance to date,



E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3192 -

in many cases, has indicated that. However, it is, on the whole, performing properly. I might say that we did not change the estimate of our reserves as previously put into the record, we merely estimated the timing, the projection of how that gas would be produced, according to an assumed schedule of development and production which seemed reasonable.

In order to facilitate that study, we grouped the wells by years of completion. We made individual well curves on a very large number of wells, particularly the 1947, all the 1947 and 1948 completions, and then we made a composite average for the 1947 completions and for the 1948 completions. The reason we selected those is that those are the wells on which we have the history of production. We examined those averages of those wells, and we compared it with the average well of the field, as a whole, and from that we developed what we considered to be an average of representative well performance as to oil production and gas/oil ratio history throughout its life. We then examined the rate at which wells are being drilled in the D-2 reservoir. As I recall, some 150 wells a year. We then projected that rate into the future until the reserves which we have previously put into the record have been drilled. Then for each group of years we estimated, based on the number of wells completed that year, the gas production which normally would result from that well completion, to give us a pool total gas history.

Now, a depletion type of reservoir, the ratio theoretically should go down at the beginning,

E.G. Trostel,
Dir.Ex. by Mr. Porter

-3193 -

during a period of time in which saturation is being built up within the reservoir sand, that generally is relatively minor, unless the sand is quite permeable, the limestone is quite permeable, that effect is hardly noticeable. And then as time goes on, with more production, the gas/oil ratio climbs and increases to a peak, which may be on the order of perhaps ten times the initial solution ratio. It depends on the relative permeability characteristics of the reservoir, and then that ratio again turns over and declines.

That procedure and theory underlying it has been covered by many publications of Dr. Muskat of Gulf, and I think is well accepted by the industry and borne out by experience. We use that technique as balancing out our gas/oil ratio as plotted against cumulative production in arriving at what would be the normal expectancy.

Then comes a question, an important question, of how a field should be allocated, how a depletion field should be allocated in the face of increasing ratios. My understanding is that the Conservation Board has a standard gas penalty factor which it imposes on wells when the ratio exceeds 1000. I believe that is in standard application at the present time with the exception of Turner Valley, and I think it is essentially correct.

We attempted to make calculations based on the application of that formula, and found it quite difficult, and we wondered why it would not be feasible, provided the gas is fully utilized, to go to a pool basis for allocation. That is quite a standard practice in many areas of the United States. And, therefore,

E. G. Trostel,
Dir. Ex. by Mr. Porter

- 3194 -

we made an assumption as to the allocation procedure which would take place, based on limiting gas/oil ratio, which is something in contra-distinction to the individual well system, but which I believe is sound. And that is this, that at the time the pool gas/oil ratio reaches 1000 cubic feet per barrel, then that gas volume will be set as a top gas production, and the oil will then, the oil allowable will then float on that gas top.

Now, that procedure is not particularly different from the gas/oil ratio penalty feature that is normally applied in the Province, and it does have the benefit of maintaining a constant gas production from a depletion type of reservoir. And when the gas is being utilized by a plant, it helps prevent waste due to changes in allocation procedure. I believe it is a sound approach, and we have followed that system.

For example, you will note in column 2 of Table 4, that we estimate the average net gas production daily will be something on the order of 8.2 million in 1951. That will increase both as the result of increased average ratio of the pool and of the increase in the number of wells.

However, in 1957, according to our estimate and our development program, the average pool ratio will approach 1000, and at that time we estimate some 32-9/10 million a day cubic feet of gas, net gas, will be produced. And we have then assumed an allocation system which will maintain that gas top constant in the interest of assisting and conserving gas, and allowing

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3195 -

the oil to float on that gas top. The effect of that procedure is estimated in column 2, and, according to our estimate, in 1969 the field is no longer capable of producing that volume of gas, subsequent to which time nature takes care of the decline shown in 1970 and subsequent years.

On column 3, the D-3 pool that is taken from our Exhibit 23, page 4, Census Division 11, and I do not believe I need to comment on that.

Column 4 is the total of the solution gas production. In our opinion, that gas should have first demand on a plant. I think that it is a fundamental basis of conservation that gas produced with the oil should have preference over gas which can be varied in volume, merely by the changing of a valve. And we have, therefore, set up basically in our total gas production picture from Leduc Column 4 as fundamental.

We then reviewed the picture of the gasoline plant in the Leduc field. We did not make a complete study of the plant by any manner of means, but it was apparent that at the present time, gas is being flared, and our estimate would be 8 million a day average waste during the year 1951. Part of that, we understand is due to a lack of gas connection facilities to the plant. And we have assumed that by 1952, the gas will be connected to the plant to the capacity of the plant, which we understand is approximately 16 million a day of net residual gas.

However, in order to meet the increasing demand of the utility system, and to take into account the

E. G. Trostel,
Dir. Ex. by Mr. Porter

- 3196 -

anticipated development of the D-2 reservoir as it is now proceedings, we believe that it is entirely economic that the plant be increased in size and that all gas produced in the field be treated by the plant. Therefore, we have postulated, in effect, increasing the size of the plant at various intervals during the next 30 years.

I might detour momentarily over to column 8. In 1951, we estimate that gas sales from the plant will be around 12 million a day. That is due, in part, to lack of connection in the plant of some 8 million a day blown to the air.

During 1952 and '53, we assume it will be logical to suppose that all of the gas in the field could be connected to the plant, at least up to the present plant capacity, and that result is shown in column 9, where, in 1952, we have an estimated gas wastage of 10.6 million feet a day, increasing to 15.3 in 1953. We believe that it would be economic for the plant to be increased in size, and we have, accordingly, made that assumption, started building, say, in 1954, the building of a 50,000,000 foot plant, and assume that 40,000,000 could be handled on the average in 1954. That 50,000,000 foot plant would be available and would be loaded to capacity at all times for the period 1955 through 1960, six years. With the increasing ratio, and I might say at that time we plant that the Lower Cretaceous sands will be put on more production, and we believe it would be entirely economic and feasible for the plant to be increased to a 70,000,000 foot plant, which will operate for a period of ten years. At the end of 1970 we anticipate that the plant can be again increased in size to 100,000,000

E. G. Trostel,
Dir. Ex. by Mr. Porter

- 3197 -

feet a day, and in 1975 to 110,000,000 feet a day.

We then wanted to get the plant - as a matter of fact, we built the plant, increased the size of the plant hypothetically here, in order to take care of the demand, and also to supply sufficient gas to meet the needs of the Northwestern Utility Company's system, in accordance with the estimates of the Board.

It may be recalled that the Board's estimate shows that the demand for gas for Northwestern Utilities' system will more than double during the next 30 years, and, fortunately, for the supply of that demand, the Leduc field seems eminently capable of supplying a large portion of the increasing demand.

Now, with that concept as to plant size, according to Column 8, we have then in Column 7, subsequent to 1954, at which time we anticipate the size of the plant will be increased, we have kept the plant continuously loaded through the entire remainder of the 30-year period. We have got that plant loaded by, first, supplying sufficient additional gas from the Lower Cretaceous non-associated gas sands to keep the plant loaded, supplying the addition beyond that gas which is produced from solution.

THE CHAIRMAN: Mr. Trostel, could I interrupt you for a minute?

A Yes.

Q Is that Lower Cretaceous gas worth processing?

A I think so, sir.

Q It is a wet gas?

A According to the analysis which we have, which came from

E. G. Trostel,
Dir. Ex. by ^{Mr.} Porter

- 3198 -

the Conservation Board, the Lower Cretaceous gas appears definitely to be worthy of processing, yes, sir.

Q You think it is?

A According to all the analyses that we have been able to obtain, sir, yes.

(Go to page 3199)

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3199 -

We then return to column 5 and essentially use the Lower Cretaceous gas sands as a balance wheel to keep the plant operating at a steady load. For example it is three million eight in 1954, eight million six in 1955 and then it drops to four million five and three million one, and one million eight over a period of 3 years, which is due to the increase in volume of gas, of solution gas. However, in 1960 we anticipate an increase in the size of the plant and a corresponding increase in production from the lower cretaceous sand. I might say that these volumes in column 6 were derived from column 5, Leduc-Woodbend field projected performance, Lower Cretaceous sands, page 33-B, Census Division 11, exhibit number 4A (Volume 2) of the May, 1951 hearing of the Petroleum and Natural Gas Conservation Board.

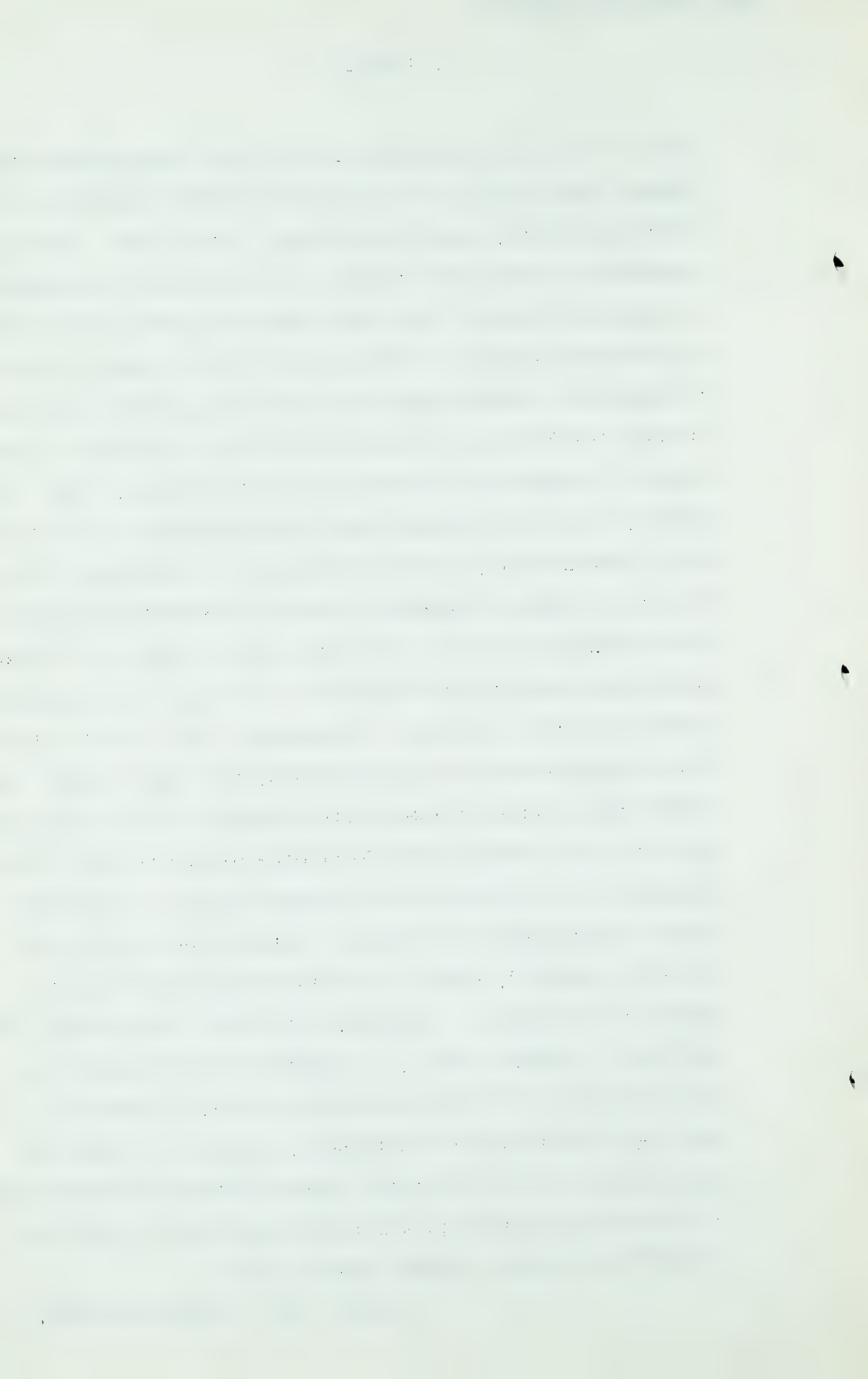
The D-3 gas cap, we anticipate, can and should be shut in for as long a period as feasible as a conservation measure and increasing the production of oil from the oil reservoir of the D-3 pool. We anticipate that while there may be some small volume of production in escapable from the gas cap over a 20-year period, the remaining gas cap can be maintained and practically shut in through 1970, at which time oil rate from the D-3 pool should have declined considerably and we feel it would not be opposed to the principles of conservation at that time to start production from the D-3 gas cap. These reserves were referred to in our previous testimony as reserves deferred by oil production. As a matter of fact, this principle was demonstrated by the previous exhibits delineating our estimate of

E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3200 -

rate of production from the D-3 gas cap. These figures in column 6 are actually less than those which appeared in the previous exhibit, equal to or less, I might say. Our basic reason why we feel that is that we could afford economically to reduce the size of the Leduc gasoline plant and process all the produced gas as the schedule herein shows is that in future the Trans-Canada will have its gas line running through the field and consequently during a period of low rates of production, low rate of utility demand, local utility demand, during the summer, gas from the plant can be picked up by Trans-Canada, so that there will be no wastage through the air of any gas produced from this increasingly large plant over a 30-year period. There is another place for Trans-Canada and the utilities' system to work out some co-operative exchange basis so that the Trans-Canada with its high load factor might take any gas produced by the plant during the summertime, a time of low utility demand, and then perhaps make that gas available the following winter to meet the peak demands of the utility on an exchange basis. I might say before passing that the figures estimated gas sales from plant in column 8, table 4, are identical with those in column 10 in table 3. In fact, this table 4 is merely, if you like, a back-up table, to furnish the information on which column 10 of table 3 has been based. I believe I mentioned previously we anticipate, in order to meet the peak demands of the utilities system during the winter that it should be feasible in a well-designed plant to operate at 125% load factor without serious loss.

I would like to refer to table 5



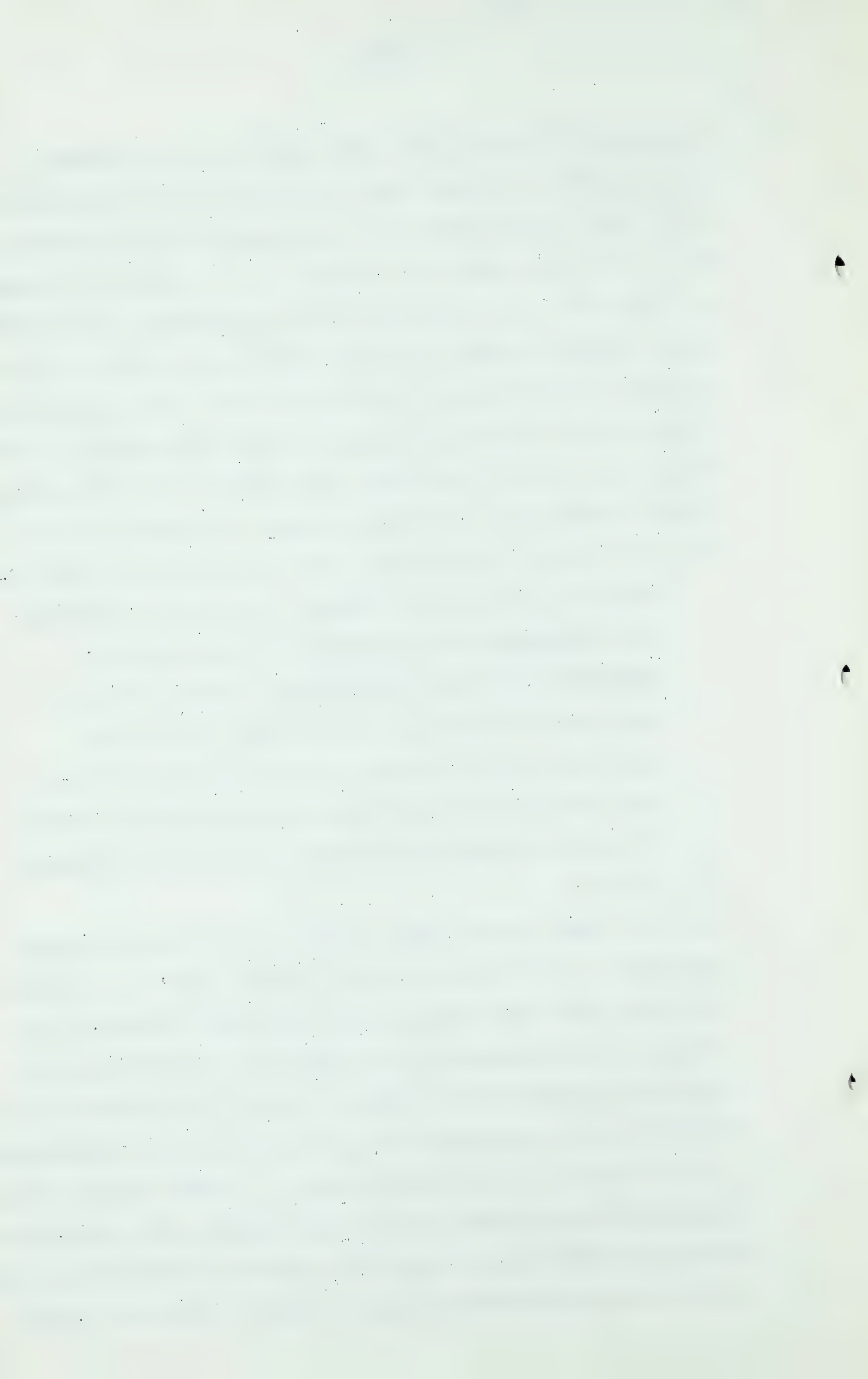
E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3201 -

appearing on page 10, and 9-B, entitled "Illustrative Deliverability Schedule for the Whitelaw-North Tangent Fields". This table is similar to the one prepared for the Pincher Creek field and shows in columns 7, 8, 9 and 10 our estimates of the total deliverability from the operation of the Whitelaw-North Tangent fields, this time starting in 1959 and is based on the assumption which I believe is now in the record that Trans-Canada intends to extend its gathering system to the Peace River country some five years after the start of full scale operations. The figures shown in columns 7 and 8 are derived from, and I am reading this from table 9 on page 9-B.

"Figures derived from Column 5 and Column 2, DeGolyer and MacNaughton-Whitelaw-North Tangent Fields - COMPOSITE PROJECTED PERFORMANCE, Page 6, Census Division 16, Exhibit No. 10 (Volume III) of the September, 1951, hearing of the Petroleum and Natural Gas Conservation Board, as modified by a factor of 1.256 for increased reserves in the North Tangent Field."

In other words, in the text of this report the derivation was given of this factor and this table, table 5, is based on 1.256 times the figures which were shown previously, to account for the additional reserves due to drilling since the time of preparing the Number 3 report and Volume 4 report. Columns 2 and 3 represent the deliverability to Trans-Canada for its own utilization and Columns 4, 5 and 6 indicate the deliverability estimated which Trans-Canada will make available to the Northwestern system in order to meet both average daily and peak demands starting in 1973. These, of course,



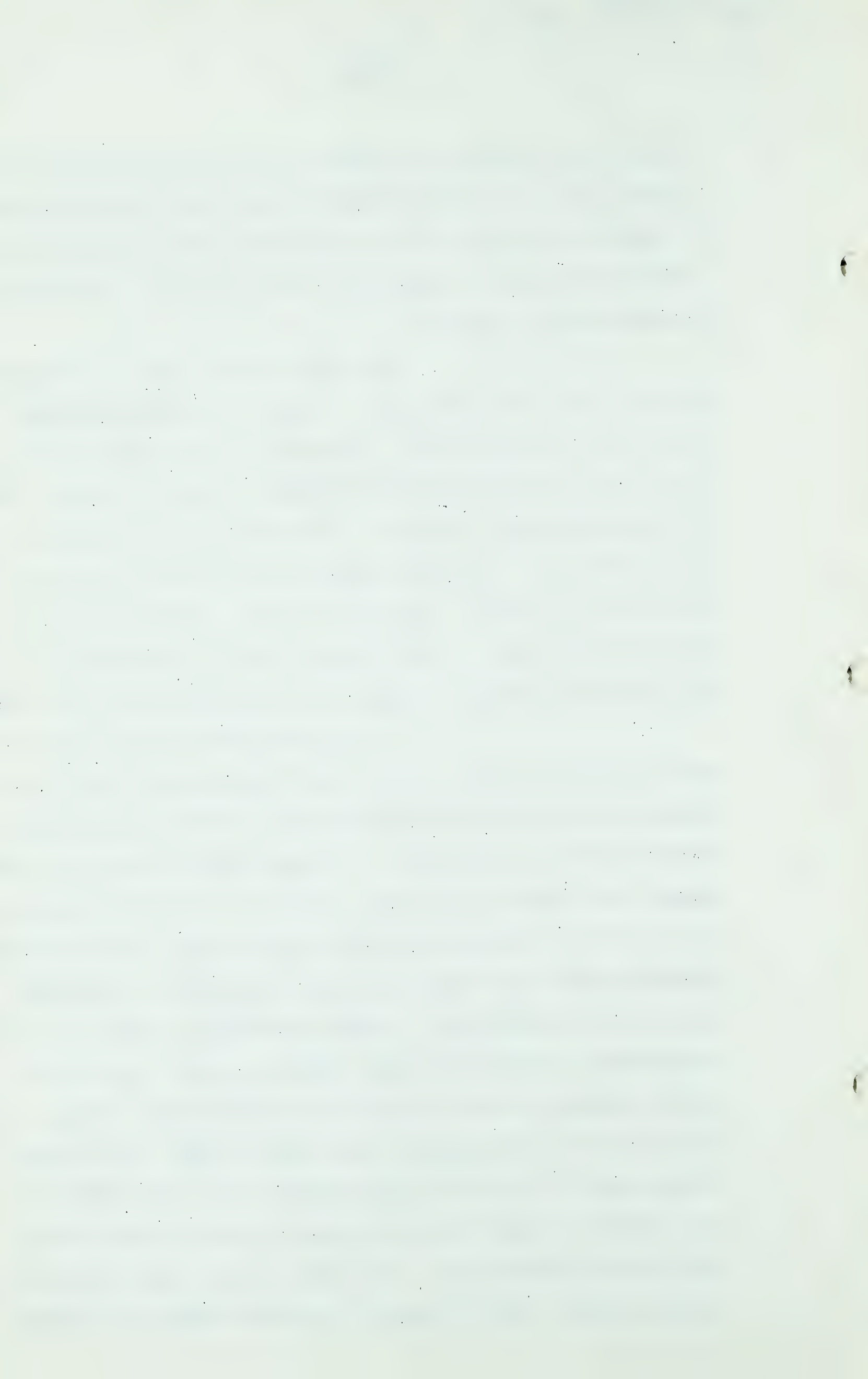
E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3202 -

are the same figures in columns 4, 5 and 6 in table 5, as columns 16, 17 and 18 in table 3, and this schedule could be considered again to be a supporting schedule to the main tabulation for the illustrative deliverability schedule for the Northwestern system.

In order to meet the peak demand, you will note, we have to go as high as 67-8/10ths% open flow. No, I am incorrect. We have to go to 67.8 million a day from the Whitelaw-North Tangent fields in 1980. That is the 1980 figure shown in column 6, table 5, and it is to be seen that that will require 42.9% of our calculated open flow, in order to meet that peak. We do not feel that that per cent of open flow is out of line for a field that will be that well along in its productive life in 1980.

I should now like to turn to table 6 which appears on page 12, and the back-up page 11-B, entitled "Illustrative Deliverability Schedule for the Picardville Field Gas Storage Project". As previously mentioned, Trans-Canada and Canadian Delhi have assured us of their intention to make this field available as a gas storage field to aid supplying the peak demands of the Northwestern Utilities' system, as they develop, in fact, starting in 1969. It is proposed as indicated on this table, columns 2 and 3, to start producing these fields at an average rate of two million six for the period from 1954 to 1960. That would produce out of the field 18.2 billion feet, some 40% of our estimated total volume of gas in place in the proved and probable categories. We feel at that time that production should stop in order to provide sufficient gas to



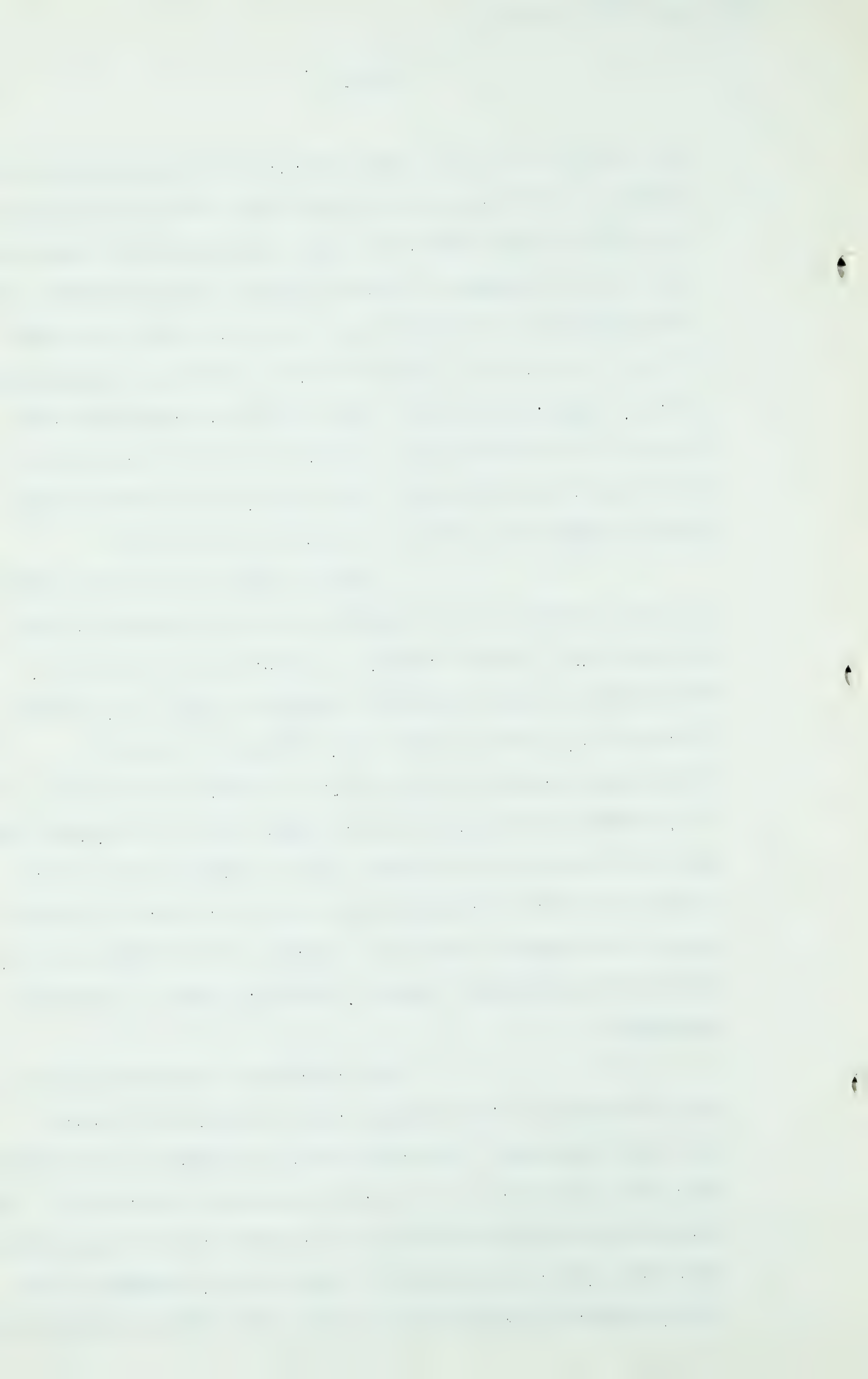
E. G. Trostel,
Dir. Ex. by Mr. Porter.

- 3203 -

give a cushion of sales and sufficient availability or deliverability from this reservoir and then during the period from 1961 through 1968 there will be a period of years in which the performance, characteristics and suitability of the Picardville field for gas storage can well be worked out. We have shown no net production from the field during that period, figuring that will be a period during which the mechanics of handling the performance of the Picardville field could well be taken care of. I think that is more than an ample time period for that to take place.

I should like to refer to column 4 and the footnote or the explanatory note opposite column 4 on page 11-B. These figures are derived from column 9, Picardville field projected performance, page 17, Census Division 14, exhibit number 10, Volume 3, op. cit. Field has estimated total well-head open-flow capacity of 131.3 MMcf per day gross, or 122 MMcf per day net, pipe line gas at the end of the seventh year of production. It is planned that this minimum open-flow capacity will be built up by the storage of gas to a maximum of 260 MMcf per day, gross or 242 MMcf per day net, pipe line gas at original pressure.

That indicates the range that we can calculate at the present time of open-flow capacity from the reservoir. It might not be desirable to entirely fill that reservoir up to initial pressure conditions. We would have something from 122 to 142 million net open-flow capacity, and if we propose to take only a maximum of 60 million cubic feet per day to meet peak storage, representing

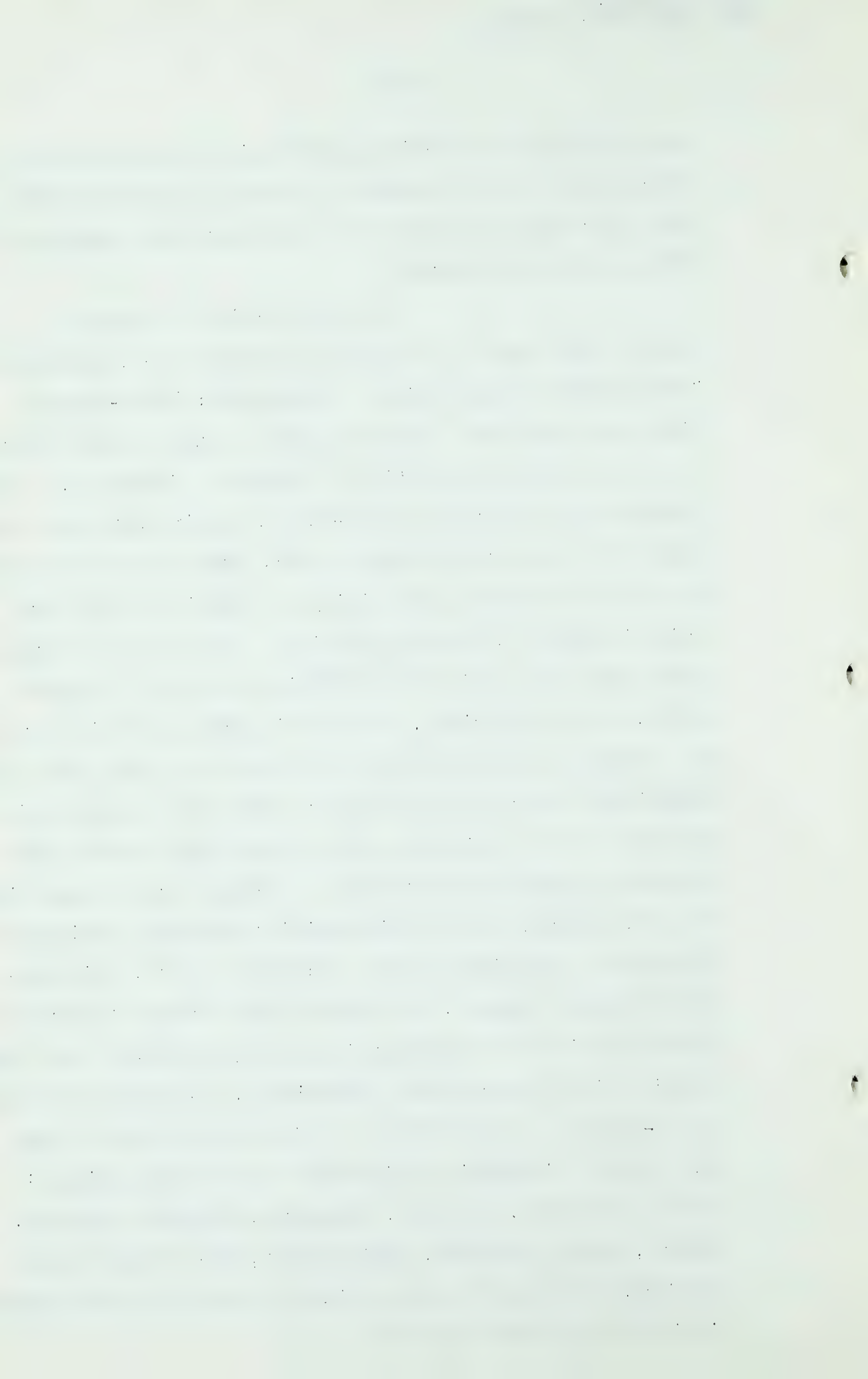


E.G. Trostel,
Dir. Ex. by Mr. Porter.

- 3204 -

about 25% of the open-flow capacity if the reservoir is returned to the full original pressure, or on the basis of just the amount of cushion gas remaining that would be a 50% open flow calculated.

I would now like to refer to table 7 which appears on page 14 and page 13-B, entitled "Illustrative Deliverability Schedule for Trans-Canada Pipe Lines Limited." This follows the same general format as the previous deliverability schedule. Columns 2, 3 and 4 represent the estimated Trans-Canada requirements and are taken from the data presented by Mr. Shattuck and Mr. Ransom as to the estimated productivity or capacity of the line under initially designed conditions. We take the average daily rate eventually up to 100% load factor. In other words, we have provided, starting in 1963, sufficient gas or estimated supplying sufficient gas at the pipe line at 100% load factor appreciating that this was a conservative approach. But we wish to work on that basis and see what happens at reduced load factors. Columns 7 and 8 come directly from the Pincher Creek deliverability schedule previously discussed a few minutes ago. Columns 9 and 10, Whitelaw-North Tangent figures, and then we have grouped together the remaining fields to which it is currently proposed that Trans-Canada will connect under Composite A, so-called and Composite B, so-called. I would like to refer to the notes to that at the bottom. "Composite A includes the following fields: Castor, Cessford, Countess, Craigmyle, Duhammel, Dunmore, Gadsby, Hanna, Leahurst, Medicine Hat, Many Islands area. In fact, that should be the Princess area, as we have defined it in our previous testimony.



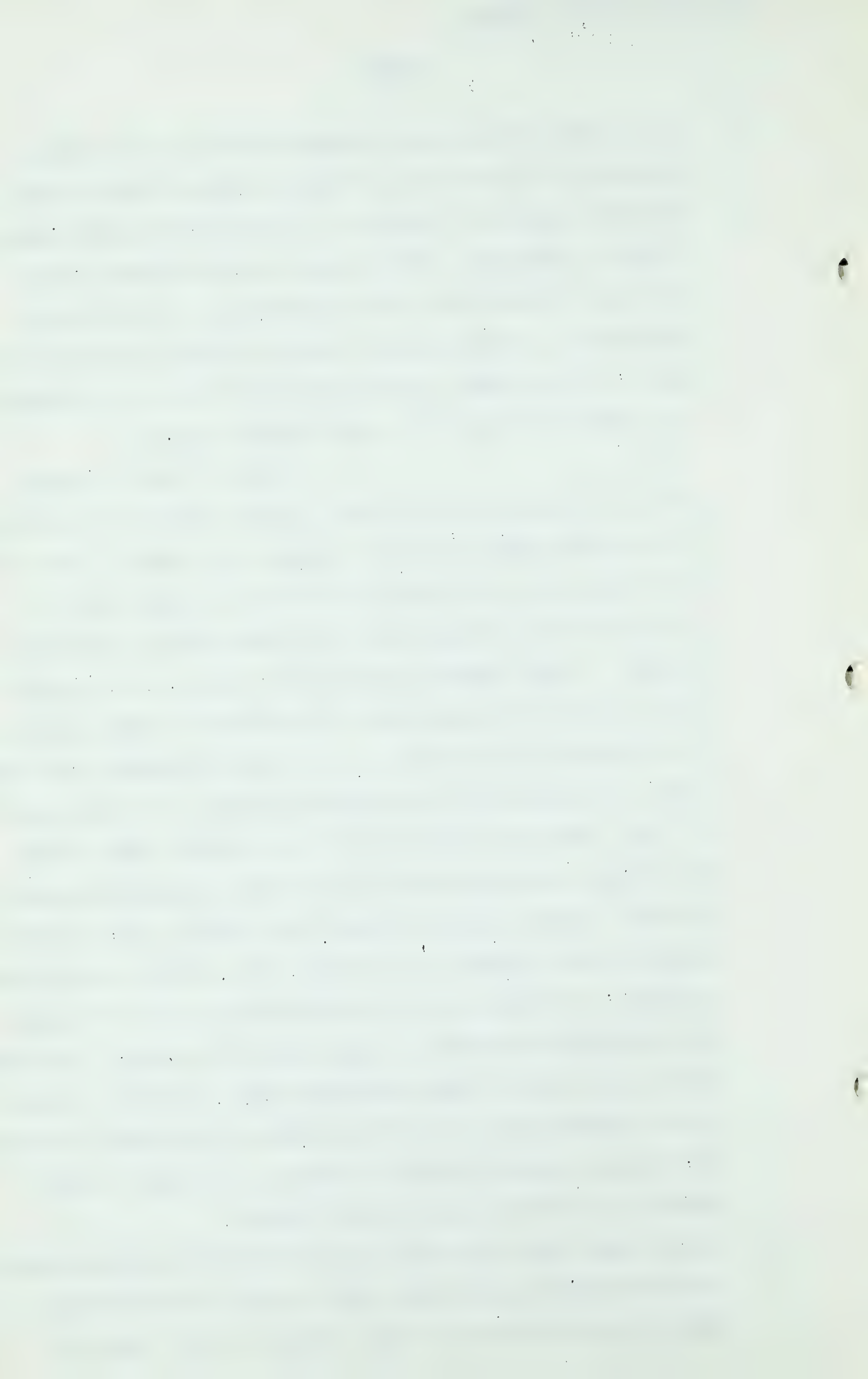
Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3205 -

A All of these fields are southern fields, if you like. Composite B includes the northern fields, fields north of Edmonton, Acheson, Bon Accord, Boyle-Mustang-Amisk Lake, Calahoo, Excelsior, Jarvie-Dapp, Jeffrey-Halfway Lake, Lily and Picardville, with Picardville, as previously scheduled, contributing gas for the project as such solely for the first seven years after which time it is planned to convert the field to a gas storage project.

It might be well in order to see how columns 11, 12, 13 and 14 were derived to turn now to the subsequent exhibits, taking, for example, Table 8 which appears on 16 and 15-B entitled "Integration of Composite Daily Average Net Gas Productivity Composite A Fields". These figures which show columns 2, 3, 4 and 5 and so forth are identically those figures which appear in our projection of volumes 1, 2, 3 and 4 wherever they may occur, as indicated by the supplementary notes which appear on 15-B, with the exception of the Cessford field where the volumes were adjusted by the factors previously mentioned. Perhaps I should repeat, though, the Viking sand, which is column 3, was adjusted by a factor of 1.339 for an increased reserve. In other words, the rates shown on our original deliverability schedule was multiplied by 1.339. The Lower Cretaceous sand in this particular case, Cessford, column 4, was adjusted by a factor of 2.373 for increased reserves. According to data currently at hand, that would be even larger if we were to do it as of today.

Q By the way, while you are dealing with that Cessford matter, is there anything you would like to say to the Board to justify your increase in those figures in the light of



Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3206 -

information to hand since the last testimony you gave?

A Well, I do not know how much detail I should cover on that. I should like to say this, that we re-studied the Cessford field, we have re-studied it continuously. In fact, we have made two complete re-mappings of the field since our submission in September. One is of approximately November 15th on which these figures are based, and within the last week we have re-mapped the field to take care of the completion of the last three wells, which added another 79 million feet, I believe, according to our estimates. We have followed the same procedure that we have explained, or Mr. Dougherty explained, some time back. We now have 14 wells in the field whereas we only had 6 at the time of our company's first presentation. These additional wells have tended on the whole to substantially increase the productive area over our previous estimate. In addition we have been able to make a better structural interpretation due to the doubling of the number of wells in the field over this period. We have more core analyses than we had before, a great deal more. We have for the first time connate water data based on the capillary state method or the restored state method, if you like, for the Sunburst sand, and, of course, many more drill stem tests and completion data on the 7 additional wells.

Without going into any more detail than that, we have re-calculated the reserves of the field following the same system, the general volumetric approach system, and using better factors, better control, as a result of the new drilling.

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3207 -

I might say that we are still of the same opinion that we were in our previous work, that Cessford field within the area of the sand development is primarily a sand deposition and the section, we feel, is quite continuous within wide limits, and that the deviations which occur are ones of building up of shale lenses within the sand section rather than another opinion, possibly, that the field consists of shale with sand lenses. We feel that with the re-mapping of the work that we have done, the cross-sections we have drawn, the correlation of the oil-water, the gas-water interfaces, all support this contention.

In the Countess field, column 5, we found it necessary to decrease our estimates there, that is, as a result of new drilling, and we adjusted our reserves downward by a factor of .761. We obtained for the first time much better structural control of the Countess area. In fact, there are three wells beyond what we now believe to be the limit of the Countess field, the Smith wells which we are not taking into account in this reserve estimate. We have not estimated reserves for that particular field and as a result that has reduced the size of the Countess field. I do not believe any more need be said about that. We do have the detail and could discuss it in more detail if someone wishes us to do so.

Columns 6, 7, 8, 9 and 10 were all derived directly, in fact, are exact copies of the information shown in the Tables as explained by the supplementary notes.

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3208 -

Column 11, Medicine Hat field, I should say the Many Islands area of the Medicine Hat field, represents relatively new discoveries, essentially the Britalta-Deep Rock properties, and we estimate that those reserves make up some 40 per cent of the total Medicine Hat field as we reported it before, and consequently Column 11 represents 40 per cent of column 5, page 12, census division 3, Exhibit No. 10, our volume 3 of the September Hearing, 40 per cent of the total Medicine Hat productivity.

The Princess field and the Provost field -- the Princess field area, I should really like to correct that over Columns 12, 13 and 14. The exhibit says Princess field. That really should be the Princess field area. In any event, columns 12, 13, 14 and 15 are taken directly from our previous testimony.

I should now like to pass on to the accompanying schedule, Table 9, which appears on page 18 and 17-B, entitled "Integration of Composite Cumulative Net Gas Production, Composite A Fields". The same remarks in regard to thousands appear here as they do on Table 8. The figures have been derived from the same sources and have been summed up eventually in column 16 to give a total accumulative net gas production from this entire series of fields. That is, the figures column 16 are the accumulative net production figures which go with and accompany the average daily rate figures shown in column 16 of Table 8. Having those two sets of figures, the two columns 16, it was then possible to plot average daily rates versus accumulative net production for

Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3209 -

this group of fields, the same technique as was explained previously, and arrive at productivity characteristics of the entire group of the composite A fields.

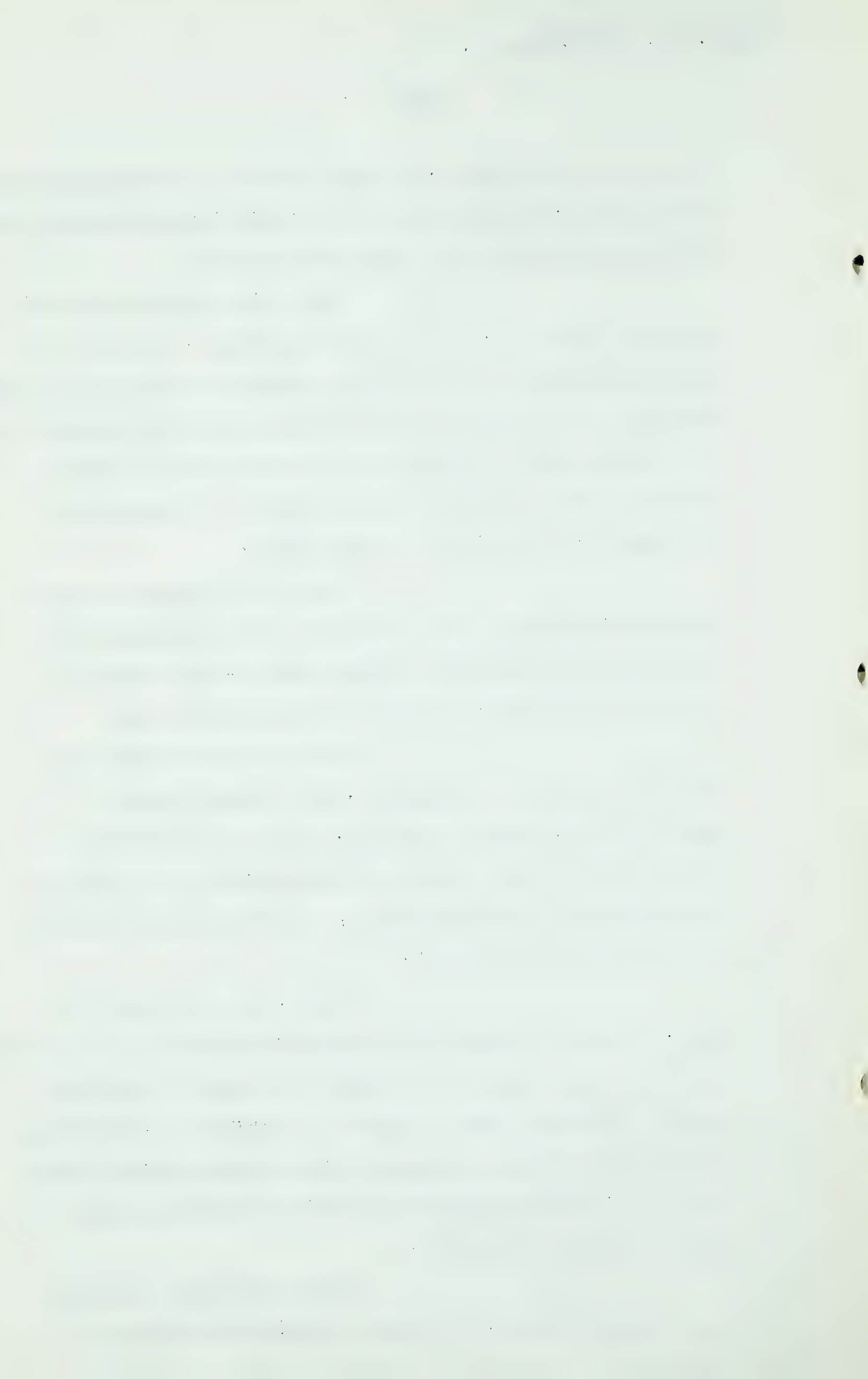
The following two exhibits Tables 10 and 11, I will go over rapidly. They are derived similarly for the fields included in those composites and with the exception of Picardville where the production is stopped after 7 years, these figures are all taken directly and are copies of the figures in the previous estimates, as explained on page 19-B.

Table 11 on page 22 and on page 21-B represent the integration of accumulative net gas production entirely similar, and the same remarks apply to this table as apply to the previous one.

When we got through with those two tables, we plotted, and it could be done algebraically, for that matter, column 10 of Table 10 against column 10 of Table 11 and arrived at a composite deliverability characteristic, a limiting characteristic, for this group of fields.

Well, now, I return, if I may, to Table 7 on page 14, and merely mention that columns 11 and 12 were derived from the plot which I mentioned was made from the data on the two composite A supporting tables and similarly column 13 and 14 were derived from a plot of columns 10 against columns 10 of the last two tables, Tables 10 and 11.

This system was used for two reasons, first, to provide complete flexibility within those two groups of fields which are in geographic



Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3210 -

areas and, secondly, to cut down on the tremendous amount of calculation which was necessary if this were on a field-to-field basis. The accuracy is not destroyed by this procedure and in my opinion has the advantage of providing more flexibility between the group of fields. We merely assume the group of fields represented by Composite A would be able to produce the figures shown in columns 11 and 12, the group of fields shown in Composite B would be able to produce at the rate shown in columns 13 and 14.

Now, columns 15 and 16 represent the total deliverability to Trans-Canada for its own requirements and represent a summation of the volumes shown from column 7 to column 14. That is, column 15 represents the column 7 plus column 9, plus 11, plus 13. Correspondingly, column 16 represents a summation of column 8, plus column 10, plus column 12, plus column 14. And it will be noted from examining columns 15 and 16 that we have been able to produce from Composite A and Composite B fields in such a manner that we are able to meet the requirements of Trans-Canada, building up to 100 per cent load factor completely through 1971, and, as a matter of fact, missing the year of 1972 by only some 5 million cubic feet of gas per day according to the calculations. In other words, the schedules or this schedule as integrated indicates a method by which the needs of Trans-Canada may be met for a period of nearly 15 years of full operation. By "full operation" I mean subsequent to the construction year. That would be actually 20 years of total operation but only 19 following the end of the construction period.

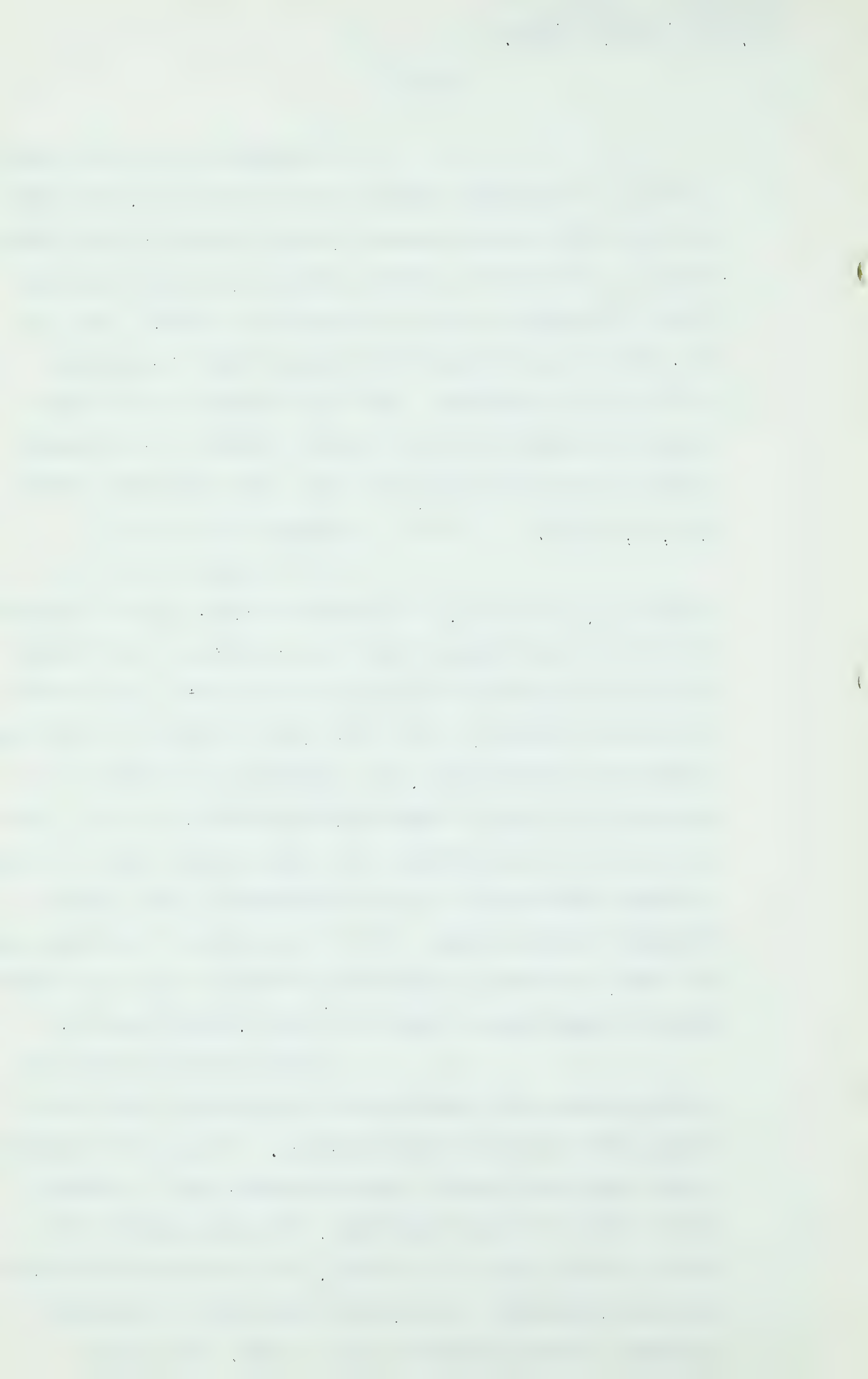
Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3211 -

It occurs to me that I have left out an important thing in all these Tables, and that is these Tables were prepared on the assumption that Trans-Canada would obtain a permit essentially immediately and start building the line in the spring of 1952. That is the assumption on which the timing of these schedules have been put together. That is allowance for the construction period and so on and the growth of the demand. I should have explained that when I was reviewing columns 2, 3, 4, and 5. It was an oversight on my part.

If we continue to look at columns 17, 18 and 19, we find that Trans-Canada is unable to meet its requirements from the presently known fields in increasing amounts subsequent to the 19th year of full operation. However, if you will look at the whole 25-year picture for Trans-Canada, the summation of column 17, it indicates it meets by some 255.2 billion cubic feet. That, of course, is considerably less than the gas that is assigned from Trans-Canada to the Northwestern system and the Canadian Western system. If it is possible to exchange gas for that, according to methods previously discussed, there should be ample gas to run the entire 25-year period.

I might say that there are several things that occur to us now that they have been taking into account in this picture. We have not estimated or put into the record a reserve picture for the Hamlin Creek field, a recent discovery. It gives promise of being a large field. Of course, it is in the Peace River area near Whitelaw. The initial well had a production capacity of some 66 million feet a day. There are



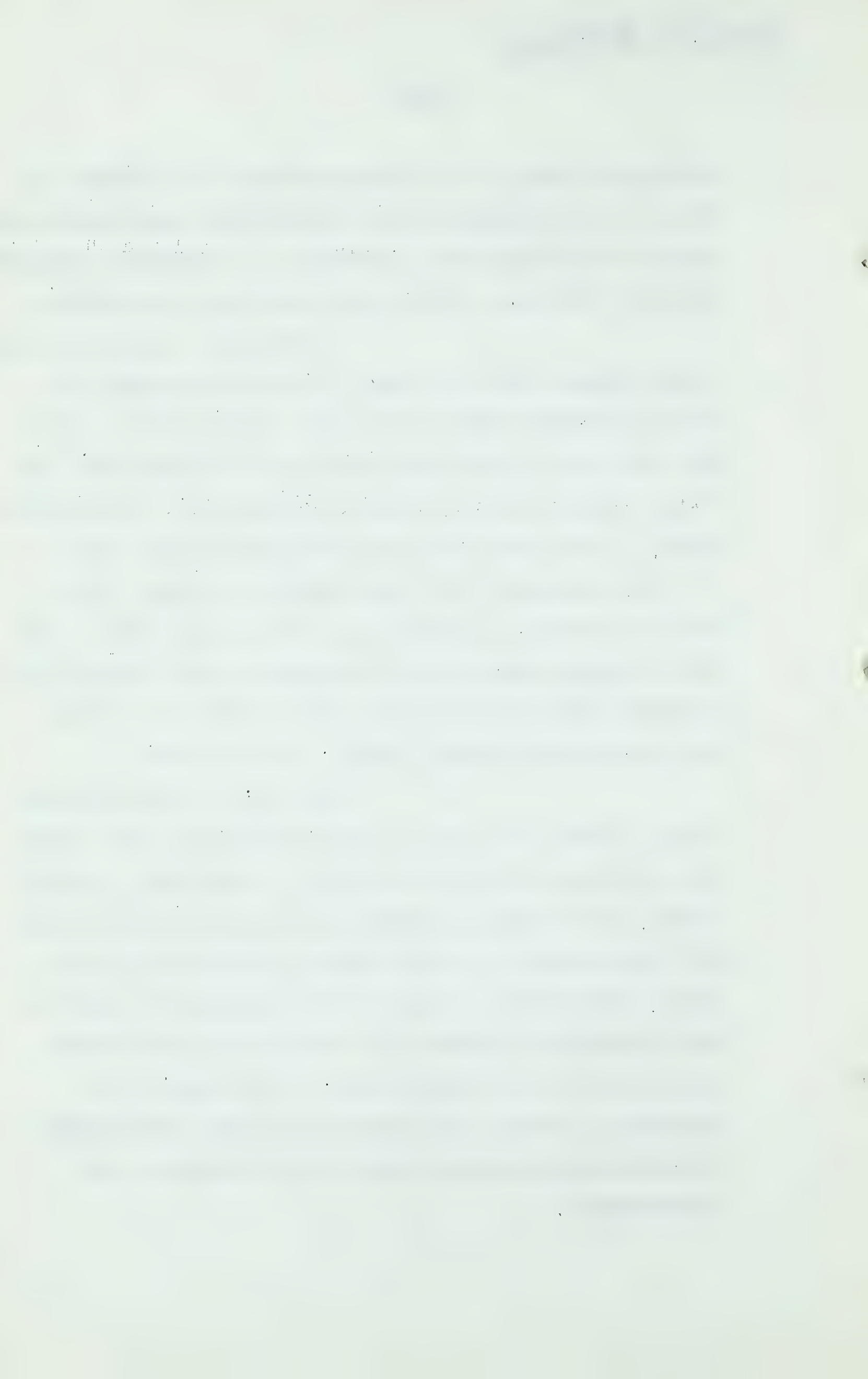
Everett G. Trostel,
Dir. Ex. by Mr. Porter.

- 3212 -

indications that it is a large area and it is natural to presume as development in that field that Trans-Canada will connect to that reserve, providing it is developed and proceeds as indicated. That reserve has not been included.

A substantial reserve exists in the Sibbald and Oyen areas. Recent developments in Sibbald indicate that may be quite a major field. Gas in that area has not been taken into consideration here, and if the promise shown by present developments, which appear actual, a few years from now somewhere down the line it will prove economic for Trans-Canada to perhaps pick up that gas we well. I might say in that regard that of the total reserves which we have estimated these deliverability schedules here do not take gas from a number of fields which have been to some, perhaps, not economic.

There is, we are instructed by our clients, the case of Legal- Morinville from which our client did not think gas would be available to Trans-Canada, so we have not considered any gas from that field for Trans-Canada or for the Utility systems as they now exist, but in toto of our reserve available for sale we have unscheduled reserves of 1 trillion 474 billion 883 million cubic feet of gas which, if you like, may be considered left for local use or, at least, not assigned in these schedules over to the Utility systems or to Trans-Canada.



E. G. Trostel,
Exam. by Dr. Govier.

- 3213 -

EXAMINATION BY DR. GOVIER:

Q What was that figure, Mr. Trostel?

A It was a figure of 1,474,883,000,000. It represents -
as a matter of fact, take all the reserves set up in this
Volume 5 and subtracting it from our total as reported in
Volume 3.

Q It did not include the unproduced reserves of the field
which have been scheduled?

A Oh, no. It is just in the additional fields to those which
are mentioned in this Volume 5 projection.

Q Mr. Trostel, before you leave Table 7, I wonder if I might
ask you how you propose to meet the peak-day requirements
during the period 1954 to 1962, when they exceed the
average day?

A I am sorry, would you read that question, Mr. Reporter,
to me?

BY THE REPORTER: "Q Mr. Trostel, before you leave
Table 7, I wonder if I might ask you how you propose to
meet the peak-day requirements during the period 1954 to
1962, when they exceed the average day?"

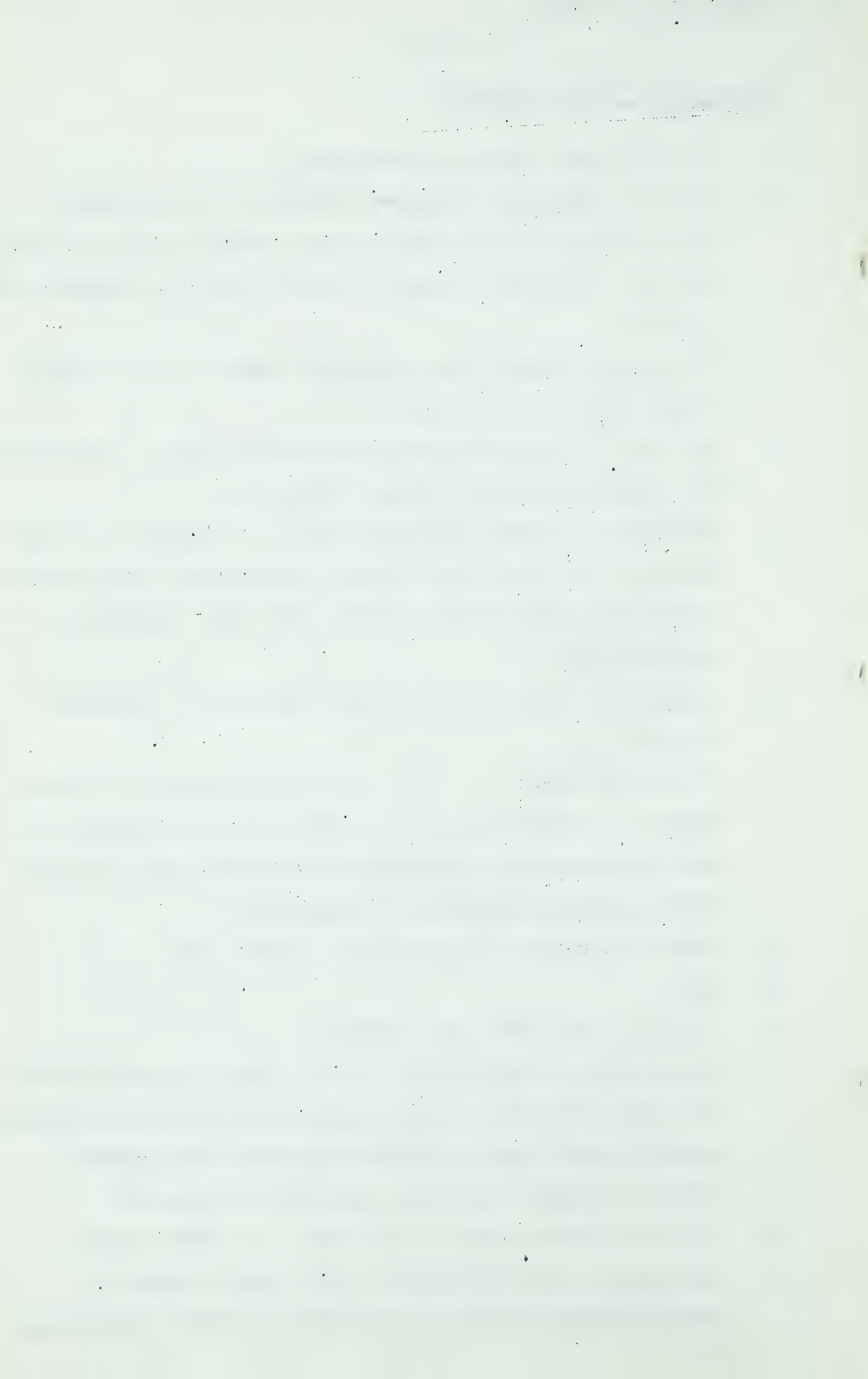
A Would you refer to a particular column, sir?

Q Yes?

A I do not have that just offhand.

Q Referring to Column 6, Mr. Trostel, where the load factor
is less than 100%, I would assume that the peak-day require-
ments of the Trans-Canada system exceeds the figures
given in Column 5, and are reported in Column 16?

A I do not believe that is the case. In other words,
the load is still building up, and these figures of
daily average, Column 5 represents a steadily increasing



E. G. Trostel,
Exam. by Dr. Govier

- 3214 -

amount of market connected to the line. That is my understanding of Mr. Shattuck's exhibit from which these figures were taken.

Q There seems to be some inconsistency, Mr. Trostel, because in the year 1954, according to Column 5, the average is 256?

A Yes, sir.

Q And if the load factor is 70% . . .

Q Yes?

A . . . then it would follow that the peak day exceeds 256, would it not?

A No, sir. That is perhaps due to my use of the load factor. My load factor represents the per cent of the average daily take to the capacity of the line.

Q Oh, I see?

A On a 100% through put basis. Perhaps that load factor is a misleading term, but I could not think of a better one.

Q It is the operating load factor of the pipe line?

A That is correct.

Q Thank you, Mr. Trostel, that clears it up.

A I believe. . .

Q Mr. Trostel . . .

A Pardon me.

Q Just to make sure that I understand this, where you have used the words "daily average" in this Table 7, they are, in fact, synonymous with peak-day requirements on the Trans-Canada system, are they not?

A That is my understanding, yes, sir.

Q Thank you, Mr. Trostel.

A I believe, Mr. Porter, that pretty well summarizes this

E. G. Trostel,
Crl Ex. by Mr. Steer

- 3215 -

Volume 5 report.

Q THE CHAIRMAN: Are you all through, Mr. Porter?

MR. PORTER: Yes, I am all through for the
moment.

.....

CROSS-EXAMINATION BY MR. STEER:

Q I think I am the one who is principally interested in
this document of yours, Mr. Trostel. Would you refer to
Mr. Porter's letter at the bottom of page 3 and the top
of page 4?

A Yes, sir.

Q "Wherever gas is transported through Trans-Canada's system
for delivery to the local utilities, Trans-Canada should
agree that the transmission charge for the service to the
local consumer or utility will be on a unit basis ascertained
on a line total throughput basis." Will you explain
that? You are going to take gas, as I understand your
scheme, from the North Tangent area for delivery to North-
western Utilities, are you?

A That is the plan, yes, sir.

Q Now, how do you compute the charge that you are going to make
to Northwestern for that gas for its transmission and sale?

A I have made no computation of that, sir. I believe that
can be worked out in accordance with the policy laid down
here. My instructions in preparing that schedule were
merely to use as a policy guide this particular information.
I did not make any exact calculations at all.

Q Well, can you give us a rough idea how that would be worked
out? Would it be on the basis of the mileage from North
Tangent, the capacity of the line, and the proportion of gas

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3216 -

that was delivered to Northwestern to the total gas that was carried through the line?

A I am not in a position to speak for Trans-Canada on that, sir.

Q I see?

A I presume you would take in all those factors that you mentioned, but that is something to be negotiated.

Q I see. Well, then, on the same page - you are not able to give us anything definite on how these charges are to be made other than what is contained in this letter?

A That is correct, sir. This is merely included to indicate our assignment.

Q What are you able to tell us about the second last paragraph on page 4, where this is said,-

"It will give local facilities a first call on all of the gas connected or inter-connected at their present sources of supply, and at Trans-Canada sources."

Does that mean that the present plan of this Trans-Canada Company and Canadian Delhi, is that the local utilities have a first call on all the gas that is in the Trans-Canada system.

A Perhaps I ought to answer that by reading the last paragraph. which says,-

"The last mentioned item affecting the price of gas in transmission are not items with which Mr. Trostel will be asked to deal...."

Q You see, Mr. Trostel, we had a couple of other gentlemen from your organization in the box, and we were told that Mr. Trostel was going to tell us all about these things, and

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3217 -

now Mr. Trostel says that he is told that he is not to do it.

MR. PORTER: You were not told Mr. Trostel is going to tell you all about these things; you were told that Mr. Trostel was going to deal with this plan, which was made at the request of the Board.

MR. STEER: Yes.

MR. PORTER: And it was in your hands at the time the gentlemen were here who might very well have been examined on it.

MR. STEER: Mr. Warterfield was in the box, Mr. Chairman, and professed no knowledge of this situation, and we were recommended at that time to apply to Mr. Trostel, who is now in the box. I think that is the situation.

Q I gather from what you have told us, Mr. Trostel, that regardless of the terms of that letter, which seem to me to mean just exactly what I say, that the local utilities are to have first call on this Trans-Canada gas, and it seems to me that from the evidence that you have given that that is not so, because we look at your Table 1, and you say to Canadian Western, I think, in Table 1, "You go and gather Pakowki Lake gas", do you not?

A We suggest that that would surely be a reasonable thing for the utility company to do, yes sir.

Q Your gathering line which extends from the south end to the north end of the Province, into the Peace River area, does not touch Pakowki Lake, am I right in that?

A No. We thought that was a logical field to leave for the utility system.

Q And your plan does not involve the willingness on the

E.G.Trostel,
Cr.Ex. by Mr. Steer

- 3218 -

part of Trans-Canada to gather Palowki Lake gas as a part of the gas that it gathers and against which it gives these local utilities a charge?

A Well, I would like, perhaps, to say, sir, that perhaps I should go back to my qualifications of these schedules, and that is that they are illustrative; that we were required to make some choice in order to make this thing come out; and it seemed most logical to us that the utility system with the gathering line presently taking gas from the northern part of the Pakowki Lake area, that it would be quite impertinent on the part of Trans-Canada if it attempted to step in and take gas out from under the utility system.

Q I wonder if, in order to carry out the direction that you were given in this letter of Mr. Porter's, which I have referred to you, and which I will read again, you should not have done just that thing.

"It will give local facilities a first call on all of the gas connected or interconnected at the present sources of supply and at Trans-Canada sources."

And you think that you should not have designed the gathering system that would gather all the gas and give the utilitiesⁱ that first charge, is that right?

A No, I do not think so. We made our interpretation of this and Mr. Porter seemed to be happy about it.

Q Yes. All right. How far is Pakowki Lake from Calgary?

A I would have to get out a map and measure it, sir.

Q Well, you do not know whether it is 200 miles? I think it is about that.

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3219 -

MR. PORTER: Pretty close.

MR. STEER: Pretty close?

MR. PORTER: Yes.

Q MR. STEER: We will say it is 200 miles. And what is your suggestion as to how Canadian Western is going to take this Pakowki Lake gas?

A I presume they will have to build a pipe line to it, sir.

Q From Calgary to Pakowki Lake?

A I would suggest that they would extend their line which goes to the Foremost area to the Pakowki Lake field.

Q Have you studied the capacity of that line and the condition of it?

A No, sir.

Q You do not know anything about it?

A Well, I would not say that I do not know anything about it, but I only have a casual knowledge of it.

Q Let us assume they have to build a line from Calgary to Pakowki Lake. What size of line would it have to be in order to accommodate the quantities of gas that you speak of?

A I have made no such calculations.

Q Isn't it true that it would have to carry 117 million feet a day?

A That would be the maximum, yes, sir.

Q And what size of line would that have to be?

A I have made no such calculations.

Q Are you not capable of giving us an estimate?

A I am capable of making that calculation. It was not my field to do it, and I do not have the data to do it.

A I see. So that you cannot tell us anything about the size of the line, or the cost of getting this Pakowki Lake gas

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3220 -

to Calgary?

A I made no attempt to make that economic study, no, sir.

Q And then, besides that, when you come to Northwestern's system, you say that the proper thing to do is to expand the absorption plant in Leduc so that it will be capable of handling, as I take it, 110 million feet a day, am I right in that?

A Finally, yes sir.

Q And connect that gas up with Northwestern?

A We thought that would be logical, sir.

Q Yes. And you have made no study of the economics of increasing the size of the absorption plant in order to do that?

A No, I would not say that.

Q You have not made any?

A No, I have casually.

Q You have?

A Yes, casually.

Q Have you got your figures here?

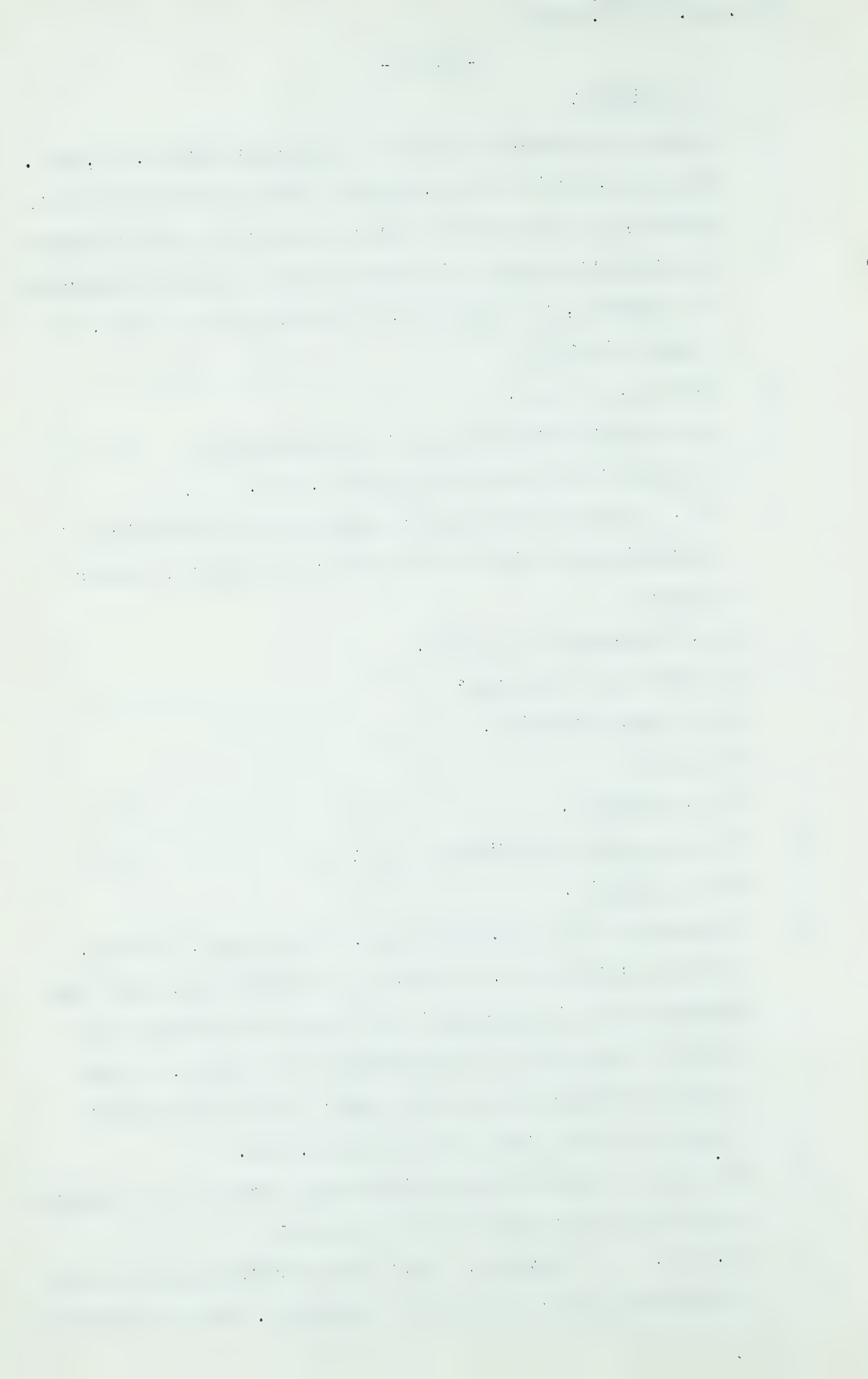
A Not in detail.

Q Do you know that Mr. MacKenzie, the manager, I think, of the Imperial Oil, has stated in evidence here that the present plant is uneconomic and that an expansion of it would be uneconomic as conditions exist today, or when he gave evidence a few months ago; do you know that?

A I believe I was familiar with that, sir.

Q And have you studied his evidence and are you in a position to tell the Board wherein it is wrong?

A No, sir. However, I have reviewed the situation with a reputable group of chemical engineers, who have advised



E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3221 -

me that the process, in their opinion, would be economic.

Q Yes? We have not got those engineers here?

A No, sir.

Q Well, then, I notice that on Table 3 you have given Viking-Kinsella, am I right in this, 667 billion feet of gas?

A Producing over the 30-year period, starting in 1951 and ending in 1980.

Q And on what is that figure based, on whose evidence is it based?

A It is based on our estimate which is part of the record.

Q I see. I have already spoken to you to some extent about this Whitelaw-Tangent scheme of yours. Can you tell me how far that is away from Edmonton, those wells?

A Not offhand, no, sir.

Q Before I leave Leduc, Mr. Trostel, are you in a position to tell us whether Trans-Canada would be prepared to build the necessary absorption plant at Leduc to carry out this scheme?

A I am not empowered to make that policy decision for Trans-Canada, but, in my opinion, I think that the capital could be raised to build that absorption plant from one source or another.

Q Do you know who - Perhaps you or my friend, Mr. Porter, will tell me - who will be prepared to tell us whether they would be prepared to do that? You are not in a position?

A I am not in a position to speak for Trans-Canada.

MR. PORTER: This is an illustrative program put forward at the invitation of the Board to show how it can be done, and the witness says that in his opinion that

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3222 -

plant is economic and can be worked out. Now, if we had enough millions to build it, I do not think any of us would be around this morning.

MR. STEER: Well, I understood that the amount of money you had was unlimited.

Q Let us talk about Whitelaw-Tangent. That is how far from Edmonton, those wells?

A Well, I presume I could get one of Mr. Warterfield's exhibits and scale it off. I do not know offhand. I am sure it is on the record.

Q 300 miles? In that neighbourhood? It is around that, isn't it?

A Two or three hundred, something like that.

Q It is up around Peace River?

A That is right. Is it east of Peace River?

Q Is it east of Peace river?

A The Peace River field?

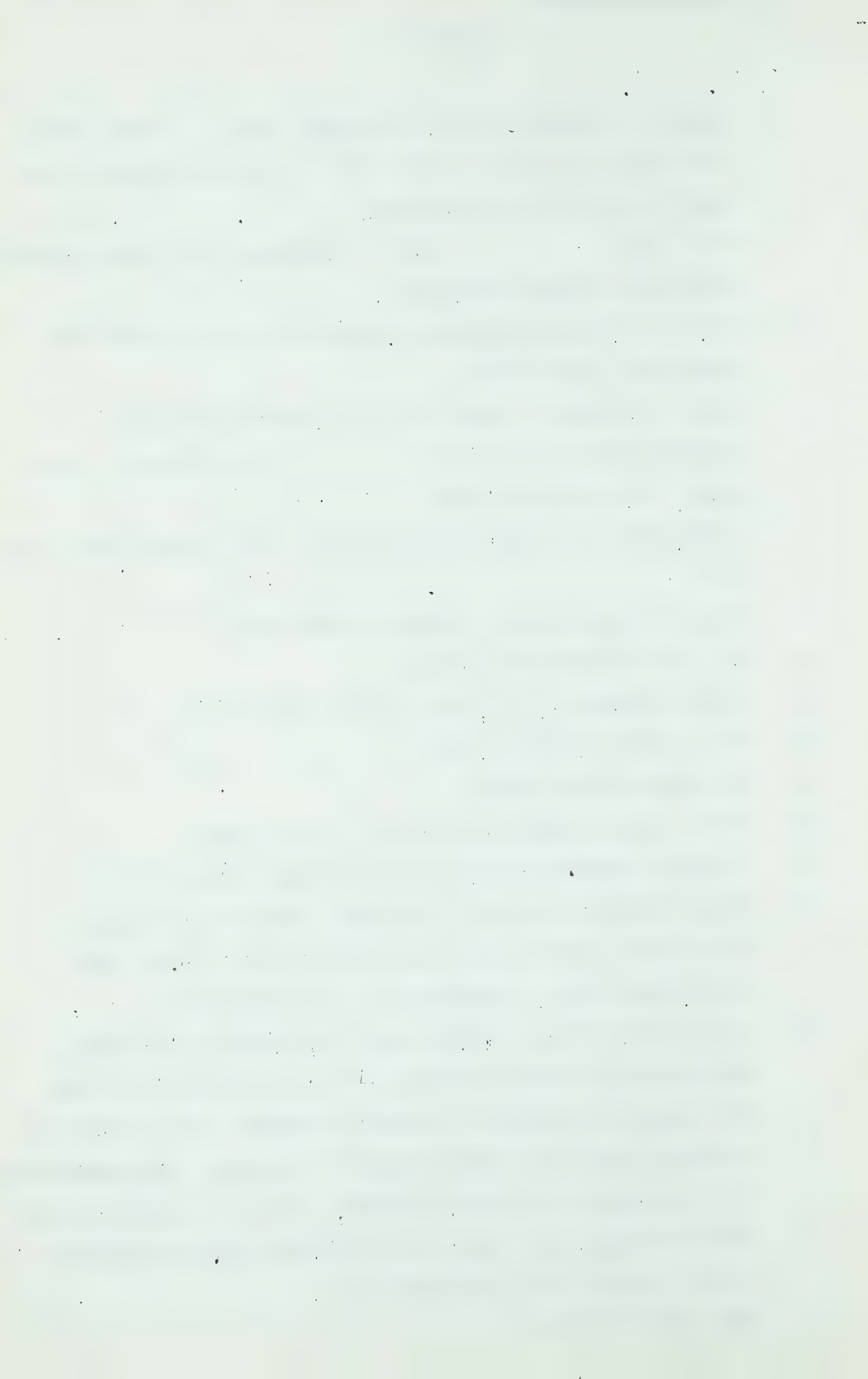
Q Is it to the east of the town of Peace River?

A I am not familiar with the town of Peace River.

Q Well, assume it is about 300 miles, what is your plan, if you will explain it, as to the delivery of that gas to Northwestern? I understand it is 330 miles?

A I will start out by saying that I am unable to say how many cents you have to do this or that with in line with the previous discussion. However, I mention the concept of exchange which was mentioned by Mr. Porter. The possibility of a development of Crown reserves, if it is feasible, then some exchange can be made in accordance with the outlines of his letter, as I understand it.

Q Now, just excuse me?



E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3223 -

A Yes, sir.

Q If that exchange cannot be worked out, and if this North Tangent gas is necessary to supply Northwestern Utilities. . .

A Yes, sir.

Q . . . then Northwestern Utilities has got to buy the gas from you and pay the field charge plus transmission costs for the distance from Edmonton up to the field?

A Well, not necessarily, sir. There are several possibilities. One of them that I mention, and that is that in our opinion the Leduc field will very probably have a summer production in excess of the demand. Now, I do not know what the minimum demand will be 25 years from now on your system. It was not estimated by the Board, and I do not know how to go about estimating the minimum that far in the future, but it seems reasonable to presume that there will be a surplus of gas produced in the summer time, and, consequently, I was thinking that during the summer the gas which would normally go to the Northwestern Utilities system could be delivered to Trans-Canada.

Q That is, from the Leduc conservation plant?

A That is right, or possibly from Viking-Kinsella, if the Company would agree so to do in the summer time, and an exchange could be made so that an equal number of Mcfs. during the winter time, when there is the peak demand, could be delivered from the Whitelaw-North Tangent area to balance it out. Now, I am unable to tell you how you would negotiate a price between the two.

Q I understood it would be Mcf. for Mcf., would it be?

A I do not believe that was stated quite like that, sir.

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3224 -

I am sure there must be some charges for that.

Q Why shouldn't it be on an exchange basis of Mcf. for Mcf.?
You are going to have to bring that North Tangent gas
down for your scheme, aren't you?

A I guess maybe it could be Mcf. for Mcf. I think it surely
could be for the Picardville storage, with the exception
of the compressor charges.

Q How much waste of gas is there in the Leduc field today,
have you any idea?

A Well, my estimate a while back that it was, it would run
around 8 million a day. I have forgotten the figure.
I looked it up in the July or August report. It is on the
order of that magnitude, and it will undoubtedly increase
unless something is done about it.

Q And am I right in thinking from Table 7 that the amount
of gas which this last estimate shows is required for the
Delhi scheme, and that it is something over 3 trillion feet?

A Would you read that back, please?

Q BY THE REPORTER: "And am I right in thinking from
Table 7 that the amount of gas which this last estimate
shows is required for the Delhi scheme, and that it is
something over 3 trillion feet?"

Q MR. STEER: I am looking at Column 4, Mr.
Trostel, of this Table 7, and the total at the bottom?

A That is correct, sir. For the period of the 25-year period
plus the 26th construction year, it would take 3 trillion l.
The amount which we estimate can be made available to Trans-
Canada is shown in column 15, 2 trillion, 937.6.

MR. PORTER: Did I understand you to say 25 or
20 years?

E.G.Trostel,
Cr. Ex. by Mr. Steer

- 3225 -

MR. STEER: 25.

Q 1953, the real operative years, 1953 to 1978, are they?

A Well, that would be 26 years over that period. It is 25 years of full pipe line operation.

Q Quite so. 1943 to 1978 inclusive?

A Yes, sir.

Q You have not available for us these new maps of yours, of the Cessford area, have you?

A I am sorry, I did not have them reproduced. They were just completed the night before last.

Q Can you tell me, broadly speaking, what the length and breadth of that area is?

A I think I may have a rough copy of that map in the Court room, if I could check it and see.

Q Yes?

A It is on a large scale, but I can give you the measurements.

Q Now, what is the question?

Q Length and breadth, roughly, of the area?

A I need to get the square root of 2. I do not remember it.

Q I would not have thought that you would need a slide rule for that?

A This is at the net Upper Blairmore gas sand. This is a map of it, which is probably the most extensive.

Q Yes?

A What we call the Delhi portion of the field is about 23 miles in length, and the Sunnynook portion of the field would be approximately 14 miles in length.

Q And what width?

A Do you wish to take the entire confines of the field? It is broken up in here?

E. G. Trostel,
Cr. Ex. by Mr. Steer

- 3226 -

Q Just give it to us roughly?

A It is about 14 miles maximum width.

Q And how many wells are there drilled in those areas?

A At the present time the wells which we consider to be the Cessford-Delhi wells, there are 14 wells in the Cessford part of the field, and the Amerada or Sunnynook field, well, the productive wells, if you like, there are 3 in the Sunnynook area, and there are - no there are 4 plus a fifth with two just beyond the productive limits. I have got to do this by horizons. In the Upper Blairmore there are three completions, producing wells, in the net Upper Blairmore, one well at the very edge which has been abandoned, one beyond the limit, and another one beyond the north limit.

Q And you think that there is enough drilling done in that area to justify the estimates that you have given here of reserves do you?

A That is our opinion, yes sir.

Q That is all, thank you.

THE CHAIRMAN: We will adjourn until 2 o'clock.

(Hearing adjourned and resumed at 2 P.M.)

E. G. Trostel,
Cr. Ex. by Mr. Nolan.

- 3227 -

8 2 P.M. SESSION.

THE CHAIRMAN: Mr. Nolan?

MR. NOLAN: No, thank you.

CROSS-EXAMINATION BY MR. NOLAN:

Q There is one small point. I have not got the document before me. It is only in connection with the Picardville storage and I did not quite understand -- on what page is that?

A It is table 10 on page 20, Mr. Nolan. I beg pardon, it is not.

Q Is it table 6 on page 12?

A It is table 6 on page 12.

Q Would you mind looking at the last column?

A Yes, sir.

Q In 1969 I take it it is 10.4 estimated deliverability to the Northwestern system?

A Yes, sir.

Q In the next year 26.5, and then it drops to 3.2 and then goes back to 26.4?

A That is correct, sir.

Q There is an explanation for that?

A There is a reason for that.

Q Yes? This is a breakdown for the back-up material we are looking at?

A That is right. These are the figures that . . .

Q . . . that are carried into the longer sheets?

A That is correct. To get the answer to that, if you will refer to Table 3 on page 6. . .

Q Thank you.

A . . . you will see there column 20.

E. G. Trostel,
Cr. Ex. by Mr. Nolan.
Cr. Ex. by Mr. S. B. Smith.

- 3228 -

Q I do.

A The same figures to which you are referring appear there?

Q Yes.

A Now that Picardville peak day storage is merely used to balance the requirements. It is the swing field, if you like.

Q It takes up the slack, so to speak?

A That is correct. If you will note, coming back to column 10 in 1971, which is the year in which the peak demand drops down from 26.5 to 3.2 from Picardville, that is the same year that the Leduc plant is increased in size from 70 million to 100 million a day, but we give first preference to Leduc plant in meeting that demand.

Q Thank you, Mr. Trostel.

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q Mr. Trostel, at the bottom of page 3 in Mr. Porter's letter appears this statement. "Wherever gas is transported through Trans-Canada system for delivery to the local utilities, Trans-Canada should agree that the transmission charge for the service to the local consumer or utility will be on a unit basis ascertained on a line total throughput basis. By this means the benefit of the high load factor of Trans-Canada's lines will be available to minimize transmission costs to local users."

A Yes, sir.

Q As I understand that, and I would like you to correct me if I am wrong, at some stage you propose to bring Whitelaw gas down and have it used by Northwestern Utilities?

A Part of the gas which is being brought down, that is correct.

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3229 -

Q And then on the basis that is outlined in that paragraph I have just read to you, Trans-Canada would be paid on a unit basis ascertained on a line total throughput basis. Thus, having made available to us your high load factor and in your view the minimum transportation cost of gas from Whitelaw, that is how that would apply to the White-law gas, I take it.

A That is my understanding.

Q I would like you to go back, if you would, to page 2 of the letter to the paragraph which says, opening with the sentence, "To accomplish this Trans-Canada's transmission lines should (5) Provide for the exchange of gas on a foot for foot basis so as to minimize transmission costs to Alberta users." I suppose you would agree that that is good sense?

A We tried to do that.

Q Now, just try and simplify that to make sure I understand what you are talking about, to minimize transportation costs to Alberta users. Would this be an illustration of that situation, supposing Northwestern Utilities owned the Pakowki Lake, for instance, and Delhi had some gas right on Edmonton's doorstep, and if you propose to take gas from the Pakowki Lake, as you do?

A We do not, no, sir.

Q I am sorry. You do not, that is correct. But assume that you did and assume that you owned that field, or rather, that Northwestern Utilities owned it and you owned gas on the doorstep of Edmonton, under this exchange idea you might say to the Northwestern Utilities "We will take your gas at Pakowki Lake and you take our gas on the doorstep of Edmonton, and we will save transportation costs into the Edmonton line

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3230 -

and we will save having Pakowki Lake gas being transported to Edmonton."

A That is the general concept, I believe, I illustrated. But in the Picardville storage system where the North Tangent gas, for example, would be brought down and put into Picardville storage on a foot to foot basis, for the same amount of gas to the Northwestern system which the Trans-Canada might have to buy in the summertime in approximately the same area.

Q I do not think you are very clear as to whether you would exchange on an Mcf basis or not. You have said in respect to this gas coming down from Whitelaw you would expect a transportation cost. But perhaps you cannot tell us about that?

A I do not recall my exact language on that. I recall saying that there would be no doubt a compression cost. That was my recollection.

Q I thought you said a few minutes ago to me that on this statement in the letter about the unit basis ascertained on a line total throughput basis, which would be charged by you to Northwestern for bringing Whitelaw gas down to Edmonton, or are you going to bring it down for nothing?

A That would depend on the particular circumstances.

Q Then you cannot answer me at the moment. I do not want to interrupt you, I am sorry.

A I do not know whether I can answer you directly or not. Our interpretation of the letter was put into the schedules which we had worked out, and I can answer on those. The exact interpretation of the situation you have raised is not one that I contemplated and . . .

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3231 -

Q Really, if you are going to exchange gas on a foot-for-foot basis so as to minimize transportation costs to Alberta consumers, basically that must eliminate carrying the gas a long way to the consumer by using somebody else's gas closer to the consumer. Basically, it means that, does it not?

A I would think so.

Q Now, Mr. Trostel, according to sheet number 14 here you are going to take into your system for the use of Trans-Canada Pipe Lines Limited quite substantial quantities of gas from Acheson, Bon Accord, Boyle-Mustang-Amisk Lake, Calahoo, Excelsior, Jarvie-Dapp, Jeffrey-Halfway Lake, Lily and Picardville (for first seven years). That is so, is it not?

A Yes, sir.

Q And then eventually you get to the point where you have to deliver some gas, as you pointed out, from Whitelaw to Edmonton, and from the proposed Picardville storage field to Edmonton?

A Yes, sir.

Q Now, can you tell me how, under this proposed arrangement, there is an exchange of gas on a foot-for-foot basis, so as to minimize transportation costs to Alberta users? I am afraid I do not follow it. I do not see how there is an exchange on a foot for foot basis there. Nor at the moment am I able to see that there is a minimization of or a decrease of transmission costs to Alberta users. You take the gas from the Edmonton doorstep and carry it on to the Trans-Canada system and eventually Edmonton has to go so

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3232 -

far as Whitelaw for some of its gas, is that the situation?

A No, I do not believe that is quite right. There are two points of view on an exchange basis, I think, that should be kept in mind. Now, if the Northwestern system with its low load factor will make available to Trans-Canada during the summer time gas which it cannot use in the Edmonton area . . .

Q Yes?

A . . . then Trans-Canada will not have to transport that gas, the equivalent amount of gas from Whitelaw and North Tangent.

Q Are you going to have a pipe line up to Whitelaw and North Tangent anyway?

A Yes, sir.

Q And what would you say, by not taking the gas down in the existing pipe line . . . There is some use of your compressor stations but there would not be much saving on a pipe line in the ground and the compressor stations there. The compressor stations would have to be staffed.

A What we do is put that gas into the Picardville storage project and then there is an exchange on a foot-for-foot basis.

Q And then you would give it back to Edmonton?

A In the wintertime on a foot-for-foot basis, and that is why I think there should be some negotiation on a fair compression charge.

Q Will you tell me how that minimizes the transportation costs to Alberta users?

A If you take a long-range plan on a 30-year basis, for either the Northern or the Southern utility's system, and you say at

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3233 -

the present time these systems have to be satisfied out of the gas now known and regardless of whether or not Trans-Canada has a pipe line or not, the utility system in either area will have to arrange for more long-distance transportation over the 30-year period, provided that no more gas is found . . .

Q Could I interrupt you?

MR. PORTER: Just a moment.

Q MR. S. B. SMITH: Go ahead.

A . . . so whether or not Trans-Canada proposes to pick up the gas and deliver it as it is needed or whether the utilities themselves are required to build their own expensive systems, I do not believe the comparison that you have made is quite on a fair basis. That is that the utilities would continue to get all the gas they needed for the 30-year picture from the immediate area from which they now produce.

Q And after that they would have to go to Whitelaw or start to go well out?

A No, as a matter of fact I am sure that there will be enough gas found . . .

Q But if no gas is found?

A If no gas is found they will have to go there.

Q And after 30 years, commencing in the year 1954, you start taking gas for Trans-Canada from Acheson, Bon Accord, Boyle-Mustang, Calahoo and Excelsior and all those other fields quite close to Edmonton, don't you?

A That is right.

Q That is your explanation, in any event, of your understanding

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3234 -

of this letter, whereby there is to be an exchange, in the words of the letter, on a foot-for-foot basis, so as to minimize transportation costs to Alberta users.

A No, I said there were two parts to the program and I had just finished the first one.

Q I am sorry. What is the second one?

A The second one ties in with the concept of Crown' reserves in the future possibly being made available.

Q Now you are talking about Mr. Porter's letter again, and not your own ideas?

A I am talking about the program outlined by Mr. Porter.

Q Which I suppose represents the program of Trans-Canada Pipe Lines. It is not Mr. Porter's program?

A We are referring to Mr. Porter's letter and there is a letter from Mr. Schultz saying Trans-Canada will follow that procedure if it is possible.

Q So it is the policy of Trans-Canada?

A Yes, sir.

Q Will you tell me how you provide for the exchange of gas on a foot-for-foot basis so as to minimize transportation costs to Alberta users, by this proposal about Crown reserves? Because I do not see that the letter says anything about exchanging Crown reserves for anything. The letter talks about the Province selling those Crown reserves at a purchase price equivalent to the royalty that would have been collected by the Government, if the gas were leased, plus, of course, whatever sum per 1000 feet the premium would represent. I do not see any exchange in respect of these Crown reserves, or perhaps I have missed

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3235 -

it in the letter, Mr. Trostel?

A No, I think you are right.

Q Yes?

A On an exact foot-for-foot exchange basis . . .

Q You have something in your mind about exchange in relation to these Crown reserves because in answer to Mr. Porter this morning you said something about your concept of the exchange relating to Crown reserves which could be used if the plan would be feasible, or something of that sort. I am afraid I did not understand it. Perhaps I did not follow it at all. Perhaps you can give us what your concept of the exchange of this is in relation to these Crown reserves. Or can you tell us anything more, because the letter does not propose any exchange at all, as far as I can see, and I think you will agree.

Q The exchange, as I conceive it, would be something like this.

Q This is something additional to the letter, is it?

MR. PORTER: Your reading of the letter.

Q MR. SMITH: Mr. Trostel agreed with me as to my reading of the letter.

A I am still talking about the second program, and the paragraph, the top paragraph on page 3.

Q And that is the one I am looking at.

A And you pointed out that the word "exchange" perhaps does not appear there and I believe you are correct. However, I think we have this in mind which would accomplish the same purpose, whether you call it an exchange or not, I do not know. Let us take Whitelaw and North Tangent, for example,

E. G. Trostel,
Cr. Ex. by Mr. S. B. Smith.

- 3236 -

where the gas is to be delivered into the Northwest Utilities system.

Q Eventually?

A Eventually, and then say that at the time, or before the time, that this gas is delivered to the Northwestern system from Whitelaw and North Tangent there may be some other gas.

(Go to page 3237.)

Everett G. Tröstel,
Cr. Ex. by Mr. S.B. Smith.

- 3237 -

Q Nearer to Edmonton?

A Nearer to Edmonton or nearer to the transmission system which Trans-Canada can develop on a Crown reserve basis. Then, in effect, that gas -- maybe the word "exchange" is incorrect -- then that gas, let us say, can be substituted in the Trans-Canada line to make up the load and the cost of gas being taken from the Whitelaw-North Tangent area into the Edmonton area can be correspondingly reduced, so that in effect the Alberta users will obtain gas at the price based on its utility that Mr. Porter proposes, even if physically they may actually be getting the Whitelaw-North Tangent gas.

Q Now, let me follow you and see if I understand what you mean. You have under your control, say, some reserves of your own at Whitelaw and you are taking delivery there into the Trans-Canada system?

A That is correct.

Q And some of that gas at some stage is being delivered 330 miles to Edmonton, and some way or another Northwest utilizes and has some Crown reserves closer to Edmonton but they are undeveloped?

A No, if Trans-Canada got some reserves and they are nearer.

Q You say this, put that into your Trans-Canada line and make more of Whitelaw available to Edmonton.

A An equivalent amount available to Edmonton at a reduced price on a substitution basis.

Q You reduce the price of the Whitelaw gas to Edmonton because you have some gas of your own close to Edmonton?

A Some of the Crown gas.

Q Some of the Crown gas which you have acquired some way or

Everett G. Trostel,
Cr. Ex. by Mr. S.B. Smith.

- 3238 -

another and the location of which you do not know, of course?

A That is right.

Q Now, I would like to ask you, also, a few questions about the acquisition of those Crown reserves which Mr. Porter suggests is the scheme or the plan whereby it is assured that no Alberta consumer will have to pay any more, which is a very praiseworthy object, I am sure. But this letter suggests that the Government could be induced to dedicate those gas reserves, those Crown reserves which they hold, to Alberta's needs, and then,

"It will be seen that Albertans would only need to pay for this gas a purchase price equivalent to the royalty that would have been collected by the Government if the gas were leased, plus, of course, whatever sum per thousand feet the premium would represent."

That is what the letter says, isn't it? It is in the middle of the paragraph on page 3 we were looking at, the middle of the first paragraph, just about half way down.

A They could pay for that without impairing Government revenue.

Q Yes, if they pay the royalty and the going premium. Of course, the Government revenue would not be interfered with in any way, would it?

A That is what is making the balance, and then if you refer --

Q Now --

MR. PORTER: Just let the witness finish.

MR. S.B. SMITH: If he wants to, but I suggest we stay with this paragraph for a while.

MR. PORTER: I suggest you let the witness finish his sentence. It seems to me I heard that somewhere.

Everett G. Trostel,
Cr. Ex. by Mr. S.B. Smith.

- 3239 -

Q MR. SMITH: Have you a sentence that is unfinished, Mr. Trostel?

A THE WITNESS: I will have to start afresh, I do not know where my sentence was. I do not believe that the proposal as written was that that would be the total gas, they could buy it for that much without impairing the Government's, the Crown's income, then if you will carry on to the next paragraph it is stated that:

"I suggest that Trans-Canada, which will be a Utility company functioning under a fixed rate of return, should obligate itself to develop these reserves at cost, carrying the expenditures for this purpose into its rate base."

Q That is the development. I have not got to the development stage yet, Mr. Trostel. I am dealing with the acquisition of these Crown reserves, so could we stay with the subject of the acquisition of them for a few minutes?

A Okay, sir.

Q Now, oil leases have gone to quite a premium in some parts of the Province, as we all know?

A Certainly.

Q And these Crown gas leases may also go to a large premium, may they not?

A I would anticipate that they would go up.

Q And you do not suggest that the Government should sell these Crown reserves of gas at less than the going price, which is the royalty plus the going premium at that time? That is what you suggest, isn't it?

A That is the way I read this, yes, sir.

Q So whether it is an arranged deal or whether it is a sale

Everett G. Trostel,
Cr. Ex. by Mr. S.B. Smith.
Cr. Ex. by Mr. McDonald.

- 3240 -

that takes place at a public bidding, that would not mean any savings to Northwest Utility if it was going to pay them at the royalty plus the going premium, that is, the market price of the gas at that time? Northwest Utility is not getting the gas any cheaper under those circumstances. Just assume Northwest was interested in the Crown reserves.

MR. C.E. SMITH: You are not assuming they are going to spend any money, are you?

Q MR. S.B. SMITH: So there would be no saving to the consumers of Alberta there, would there?

A I do not know the profit margin to the Northwestern Utility system.

Q But I am talking about the saving in the acquisition of the land?

A And just the acquisition alone? I think you are correct.

Q Then you suggest you would go on and develop those lands at cost, carrying the expenditure for this purpose into its rate base. Isn't that just what the local utilities do? They develop those fields they get at cost and carry those expenditures into the rate base, don't they?

A I presume they do. I am not familiar with that.

Q Exactly what you proposed?

A I do not know what the relative weighting of one to another would be.

Q All right, thank you.

CROSS-EXAMINATION BY MR. McDONALD:

Q Just a few question, Mr. Trostel. Could you tell me if this proposal that was being discussed with Mr. Smith a moment ago with regard to these Crown reserves, whether

Everett G. Trostel,
Cr. Ex. by Mr. McDonald.

- 3241 -

that was drawn up having regard to the natural gas regulations as they are now in effect in the Province?

A I do not know. I was given to me as part of my assignment.

Q Yes. You do not know whether if natural gas regulations were carried out as they were drawn and intended that there would be a very minor amount of natural gas acreage available as Crown reserves? You do not know anything about that?

A No, I am taking this statement at its face value.

Q Would you also tell me whether the cost of development referred to on page 3, revised 2¢ for development, whether that 2¢ was arrived at after consideration of Mr. Ralph E. Davis's evidence as to cost of development in the Viking-Kinsella field, given in evidence some time ago?

MR. PORTER: I wrote the letter and I would like to tell you I did not use his advice.

A THE WITNESS: I do not know the answer myself.

MR. C.E. SMITH: He likes it, then.

Q MR. McDONALD: Yes. And then this question of financing, as I take it from the letter as a whole, and you can tell me if I am right, that the development would be carried on by Trans-Canada as a public utility?

A "I suggest that Trans-Canada, which will be a utility company functioning under a fixed rate of return, should obligate itself to develop these reserves at cost, carrying the expenditures for this purpose into its rate base."

Q The effect of that will be along the lines Mr. Brownie gave the other day, dry holes to operating expense and

Everett G. Trostel,
Cr. Ex. by Mr. McDonald.

- 3242 -

investment in productive wells would be carried into the rate of return. That would be a logical conclusion to draw?

A I really do not know about the tax structure in Canada.

Q What would you think if dry holes were charged to operating expenses and were deductible for income tax and 52 per cent of this would be carried as a contribution from the taxpayers?

A I do not know anything about that. I am really not familiar with that.

Q Now, the other thought I had in mind, dealing with the Pakowki Lake, Mr. Trostel, do you know the Btu. value of the Pakowki Lake gas?

A I can get it for you in just a moment, I believe.

MR. C.E. SMITH: Tell him, then, and he would probably agree.

Q MR. McDONALD: It is in Exhibit 3, is it, you are looking at?

A I believe it is not in Exhibit 3, Pakowki Lake?

Q Give me the number of the exhibit and I can look it up.

A Pakowki Lake on reserves, we have a breakdown by specific fields within the Pakowki Lake area. Chin Coulee, I guess, is not really in the Pakowki Lake area.

Q Any one will do.

A We have a figure of 900 plus for Foremost, and we apparently have a quite accurate figure of 943 from Manyberries. We have a range from Pendant d'Oreille varying from as low as 873 to as high as 964.

Q Well, that will be sufficient unless you have another one handy there.

A Pinhorn, it is a very small one, 900 plus.

Everett G. Trostel,
Cr. Ex. by Mr. McDonald.

- 3243 -

Q The reason I mentioned it was, it has always been made an objection to the use of Pakowki Lake for the Canadian Western system because of its deficiency in Btu.'s of gas in that particular area. Just one more thing, Mr. Trostel. In the price of gas, the price of transportation of gas to the Edmonton district, and dealing only with bringing it down to Jarvie, I was wondering do you recollect Mr. Warterfield's exhibit showing that the cost was some 17 million dollars, the capital investment?

A I seem to recall that, yes, sir.

Q And then you agree with me that an over-all annual cost would be about 18 per cent of the investment. I mean, that has been a figure that has been used for quick calculation of costs of transportation?

A You mean, about something a little over five years?

Q Yes. 18 per cent being the annual charge that would be required to maintain a line that cost 17 million dollars to instal?

A I am not a pipeline man, I am not qualified to answer that.

Q Would you take my suggestion, then, that on that basis the cost of operating that line would be some 3 million dollars per year?

A That is 18 per cent of 17 million dollars? That sounds right.

Q And looking at your exhibit, we find that in the first year you have 4.6 billion moved to the Edmonton district from the Whitelaw-North Tangent, Table 5, page 10, of your exhibit. 1959 you show annual Mcf. 4.6 billion?

A Yes.

Q Now, on that basis, then, the annual cost of 3 million

Everett G. Trostel,
Cr. Ex. by Mr. McDonald.
Cr. Ex. by Mr. Mahaffy.

- 3244 -

dollars to operate the line, my calculations show that the per Mcf. cost is 65 cents to move the gas from Whitelaw to the Jarvie field.

A For those few Mcf. as we are building up the load?

Q Yes.

A I think that would be fair. However, I would like to point out you can not look at the mechanics of any small part of the line, you have to take the whole over-all project. It is like a branch railroad or something of that kind. If that is something that makes the deal go you must consider the entire project as a unit.

Q Now, carrying my analogy on and using that individual Mcf. of gas, you add 50 cents to it to get it to Toronto, and it costs you \$1.05 in Toronto?

A If you could take a molecule I think that would be right. However, you have to look at the economics of the entire picture. I do not think you should pick on one year in the period of building up a new expansion.

Q Thank you.

MR. MARTLAND:

I have no questions, sir.

CROSS-EXAMINATION BY MR. MAHAFFY:

Q Mr. Trostel, I am sorry Mr. Porter's letter is giving you so much trouble. I would like to ask one or two further questions on page 3. Some of my learned friends have gone down through that page with you, but we come finally to a place where the price of gas is discussed and we have $1\frac{1}{4}$ to $1\frac{1}{2}$ cents, and then it says:

"and so far as Prairie structures are concerned,
something in the vicinity of 2¢ for development,

Everett G. Trostel,
Cr. Ex. by Mr. Mahaffy.

- 3245 -

"making a price for domestic consumption of $3\frac{1}{2}\phi$,
or at the most, 4ϕ in the field."

Now, I take it that is what we call at the input to the gathering or transmission system. Is that the way you understand that price?

A I would think so.

Q So that it includes everything in the nature of cost including gathering systems in the field and all that sort of thing?

A Of course, I am interpreting this letter just like you are but --

Q I hope you are not reading my mind.

A It appears to me that Mr. Porter has added the 2ϕ for development to the figures in the previous paragraph of $1\frac{1}{4}$ to $1\frac{1}{2}$ and has arrived at this $3\frac{1}{2}$ or at the most 4ϕ by simple arithmetic.

Q And that includes the drilling of the wells and the gathering of the gas?

MR. PORTER: Does it say so? The items are listed.

MR. MAHAFFY: Perhaps Mr. Porter would like to carry on and tell me.

MR. C.E. SMITH: He is anxious to get up. Don't start, will you, Mr. Porter.

A THE WITNESS: I guess I can not read beyond what it says. It says 2ϕ for development and $1\frac{1}{4}$ to $1\frac{1}{2}$ on a basis of not impairing the Government revenue.

Q MR. MAHAFFY: All right. Now, I realize this may be a bit beyond your ken, Mr. Trostel, but in the

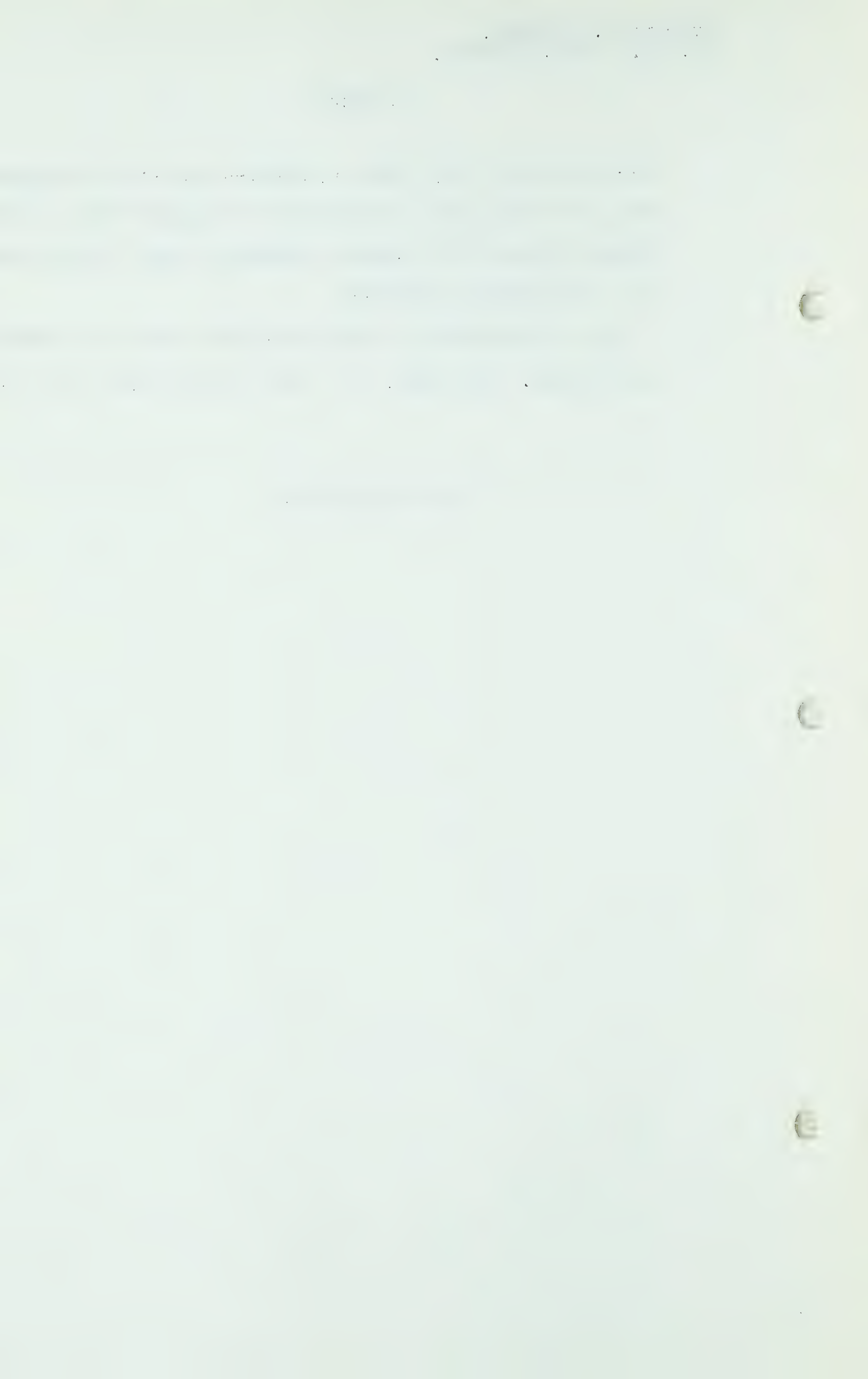
Everett G. Trostel,
Cr. Ex. by Mr. Mahaffy.

- 3246 -

work which you have done in Alberta and the investigations that you have made, do you know of any gas that is now being produced at 4 cents a thousand ready for delivery to a transmission system?

A I find it difficult to understand the meaning of what you are saying. You mean, do I know of any sales for 4 cents?

(Go to page 3247)



E.G.Trostel,
Cr. Ex. by Mr.Mahaffy

- 3247 -

Q Well, yes, we will put it that way if you like?

A I do not know of any sales other than what I have heard reported, like Turner Valley and Jumping Pound.

Q Do you know of any cases where they get within this cost of 4 cents?

A I just have not investigated, sir. I do not know how much dry gas is being sold actually at the present time, outside of the two utility companies.

Q Well, let us leave that then. Now, just one other point I would like to ask you a few questions about. If I understand your deliverability statement, which you have presented today, it is absolutely essential, in order to enable you to work out that deliverability, that there will be a certain amount of what we call pooling of fields, in other words, pooling of gas supplies?

A You mean because of the composite?

Q Yes?

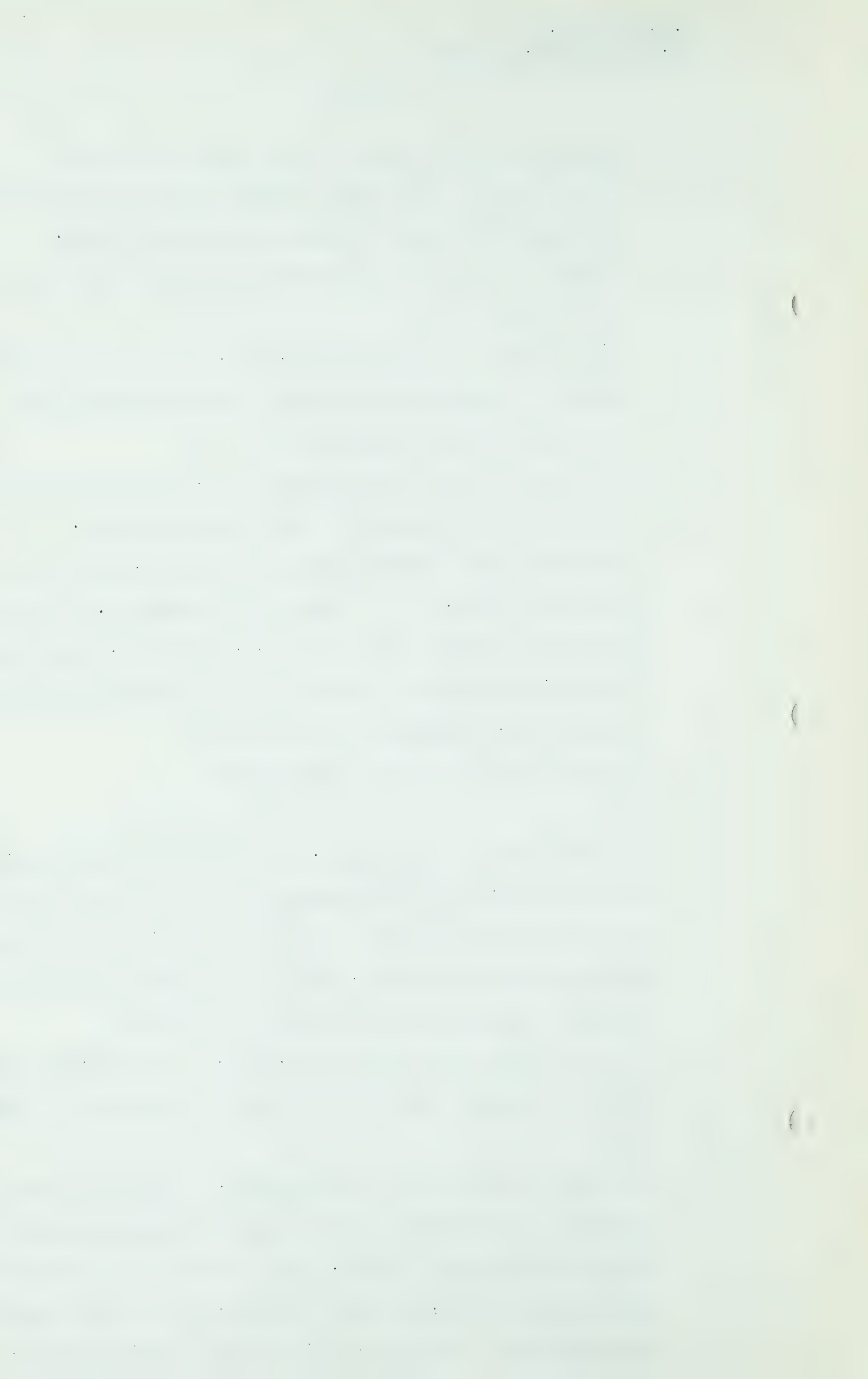
A No, that was not necessary, that was merely convenient.

Q Can you provide for deliverability to the local systems - I will put it this way: Can you provide for the local distributors in Alberta, and at the same time for your export needs without a pooling of supplies?

A I do not quite understand you, sir. The pooling was merely of these fields that we did in composite A and B.

Q Yes?

A And that was done for two purposes. One of them was that it would not be necessary to specify any particular field producing an exact amount, but it would give flexibility within that group, so that the group as a whole could produce that. However, I could have calculated it. There



E. G. Trostel,
Cr. Ex. by Mr. Mahaffy

- 3248 -

would have been more work on an individual field by field basis. To sum that up, in each case these Tables would have stretched out as many columns for each field as are here for the group of fields.

Q You misunderstand me, Mr. Trostel. I am not dealing with your two columns composite A and composite B, I am dealing with the general Provincial picture. I am suggesting to you that in order to achieve deliverability for the local systems and for your export lines, that, of necessity, you have to work out that deliverability on a pooling of the field basis?

A I suppose you could call it pooling of the fields. We, in setting up these illustrative schedules, we took all the gas from a field to Trans-Canada. For example, Pincher Creek, and after that delivered out of the Trans-Canada line to the southern system.

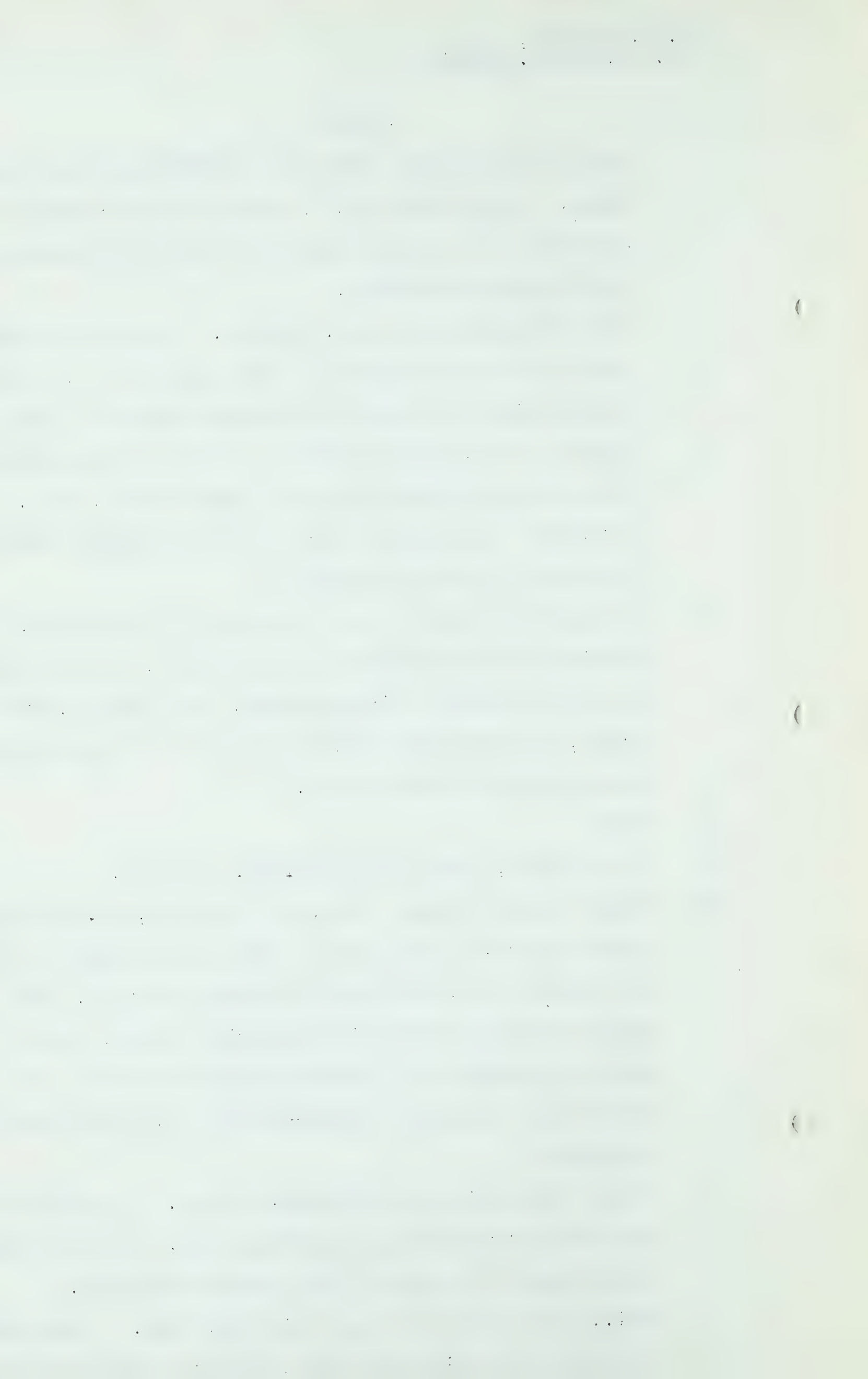
Q Yes?

A If you like, that is the pooling, yes, sir.

Q That is what I mean. Now, in your view, Mr. Trostel, is there any reason, should the Board or Government feel that it should be so, is there any reason why that, what we have called the Provincial gathering system, why it should not be handled by a separate corporation which, in turn, would then sell gas to Trans-Canada at the Provincial boundary?

A I have never given consideration to it. It was not in the design problem that we worked with. I do not know enough of the policy to answer that question properly.

Q Well, let me put it to you this way, then: From what you do know of the situation here, and from your experience,



E. G. Trostel,
Cr. Ex. by Mr. Mahaffy
Cr. Ex. by Mr. Macleod

- 3249 -

do you see, offhand, any objection to it?

A I have not made an economic analysis of it, sir. I really do not believe I am entitled to have an opinion.

Q You have no opinion at all?

A Well, as an engineer, I do not believe I should express an opinion without having done some work on it, and I have not.

Q I see. All right, thank you, Mr. Trostel.

.....

CROSS-EXAMINATION BY MR. MACLEOD:

Q In connection with your contemplated assistance to the Canadian Western, you give the Pakowki Lake area gas to that system in this Table 1?

A Yes, sir.

Q You have it under two headings, "Chin Coulee" and "Pakowki Lake", and I understood you to say that that practically was Pakowki Lake?

A Yes, sir, that is right.

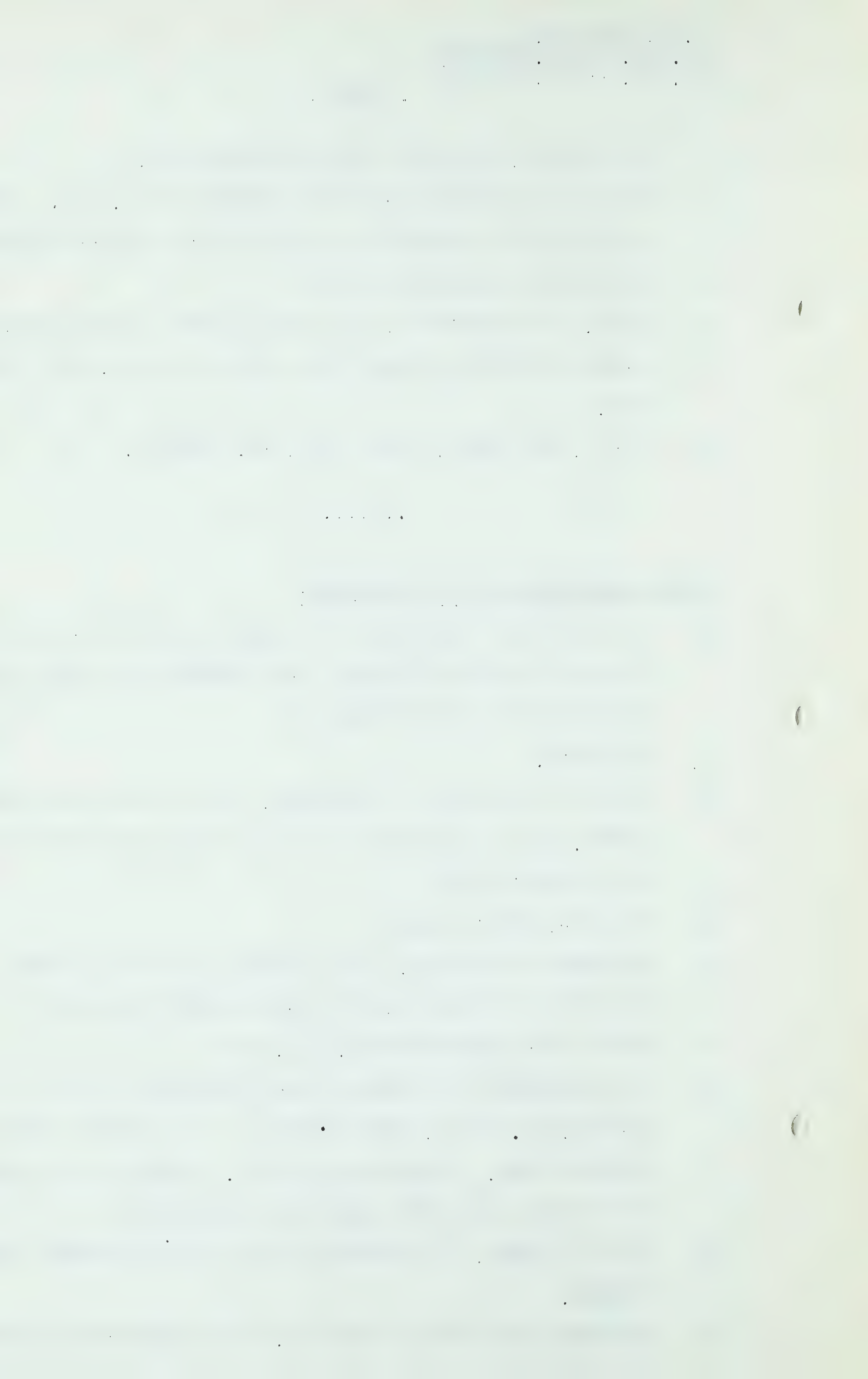
Q You know, I presume, that Calgary is the main centre for the use of the gas supplied by Canadian Western?

A That is my understanding, yes, sir.

Q And assuming it is true, as was suggested to you by my friend, Mr. Steer, this morning - by the way, you chose Pakowki Lake, I think you told us, because of its proximity to the pipe line that was now in existence?

A That is right. It seemed to be the logical choice of gas supply.

Q Assuming the truth of what Mr. Steer suggested to you this



E. G. Trostel,
Cr. Ex. by Mr. Macleod

- 3250 -

morning, which I think is borne out, that the line by reason of its size and age is not capable of carrying the Pakowki Lake gas to Calgary, that reason would be gone if you had to build a new line?

A Well, certainly, and if it was to meet the 30-year requirements, and to do that out of known reserves for 30 years for the utility system, and I thought I mentioned this morning, I guess I did not this morning, there will have to be some change in the facilities, because, after all, the load is going to double or something of that nature in the Calgary system.

Q Now, there is a field known as Cessford, isn't there?

A Yes.

Q That you are developing. And you gave us some figures with regard to it?

A Our client has an interest in the field, yes, sir.

Q What is its reserves? I think you gave us something that is later than what was presented?

A The last figure that we have at present is 873,157,000,000.

Q That is well over twice Pakowki Lake?

A Yes.

Q With regard to the highest estimate given?

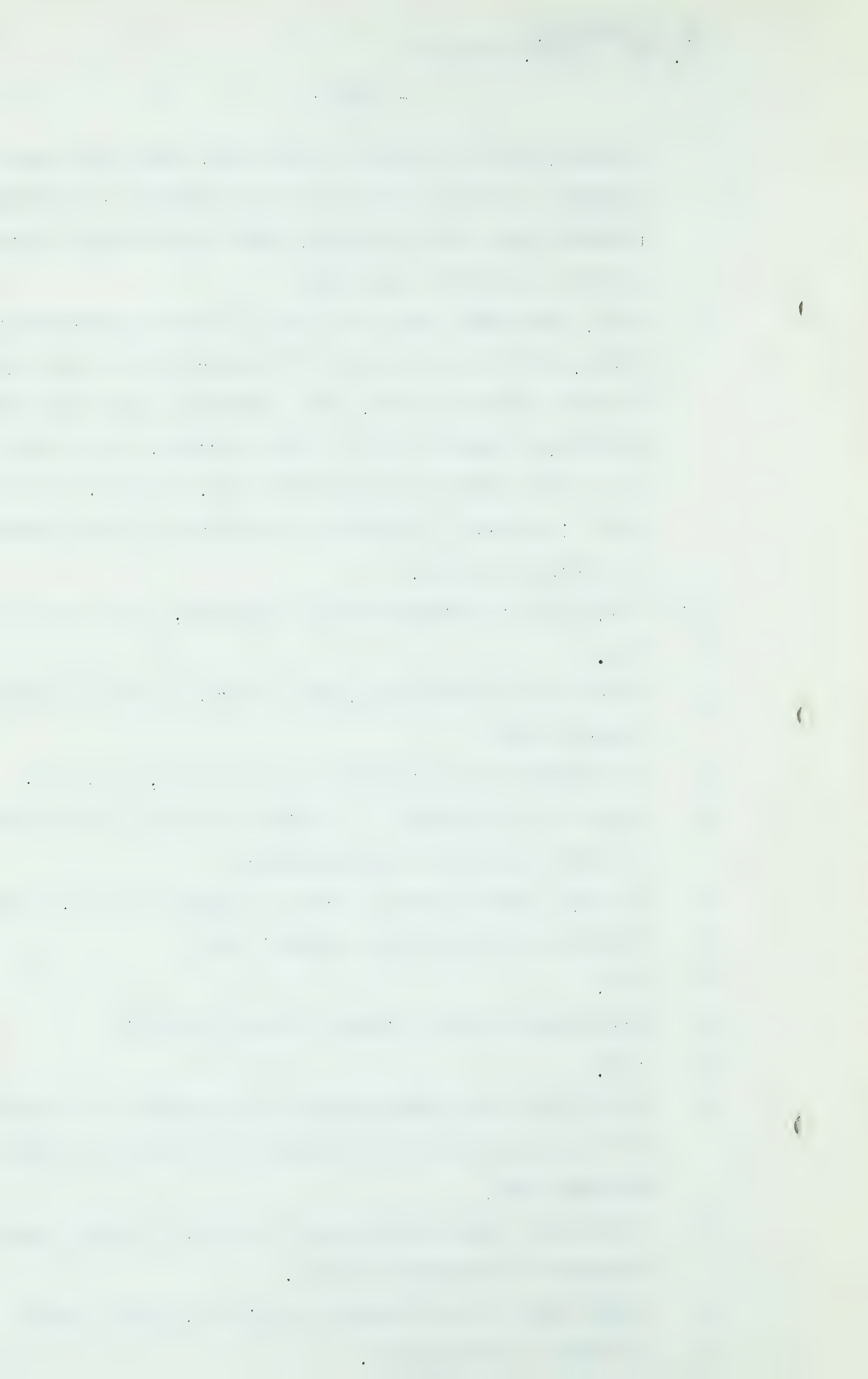
A Yes.

Q And do you know enough about the geography of Alberta to tell us the relative distances from Calgary to Cessford and Pakowki Lake?

A I can get a map and find out for you. It would appear that Cessford is something closer.

Q About half of the distance, isn't it, by air line?

A It might be two-thirds.



E. G. Trostel,
Cr. Ex. by Mr. Macleod
Re. Ex. by Mr. Porter

- 3251 -

MR. C. E. SMITH: That is a new expression "by air line".

MR. MACLEOD: I was taking it direct.

Q And the distance would be larger still if you followed the present pipe line, the curve?

A It is not quite twice.

Q It is not quite twice?

A No.

Q And it would be more than twice as far, if you followed the curve of the pipeline that is there now?

A That might well be. I do not have the line on this map.

Q Thank you.

MR. PORTER: Mr. Chairman, there is one item I would like to raise with Mr. Trostel, because there seems to be some confusion about it.

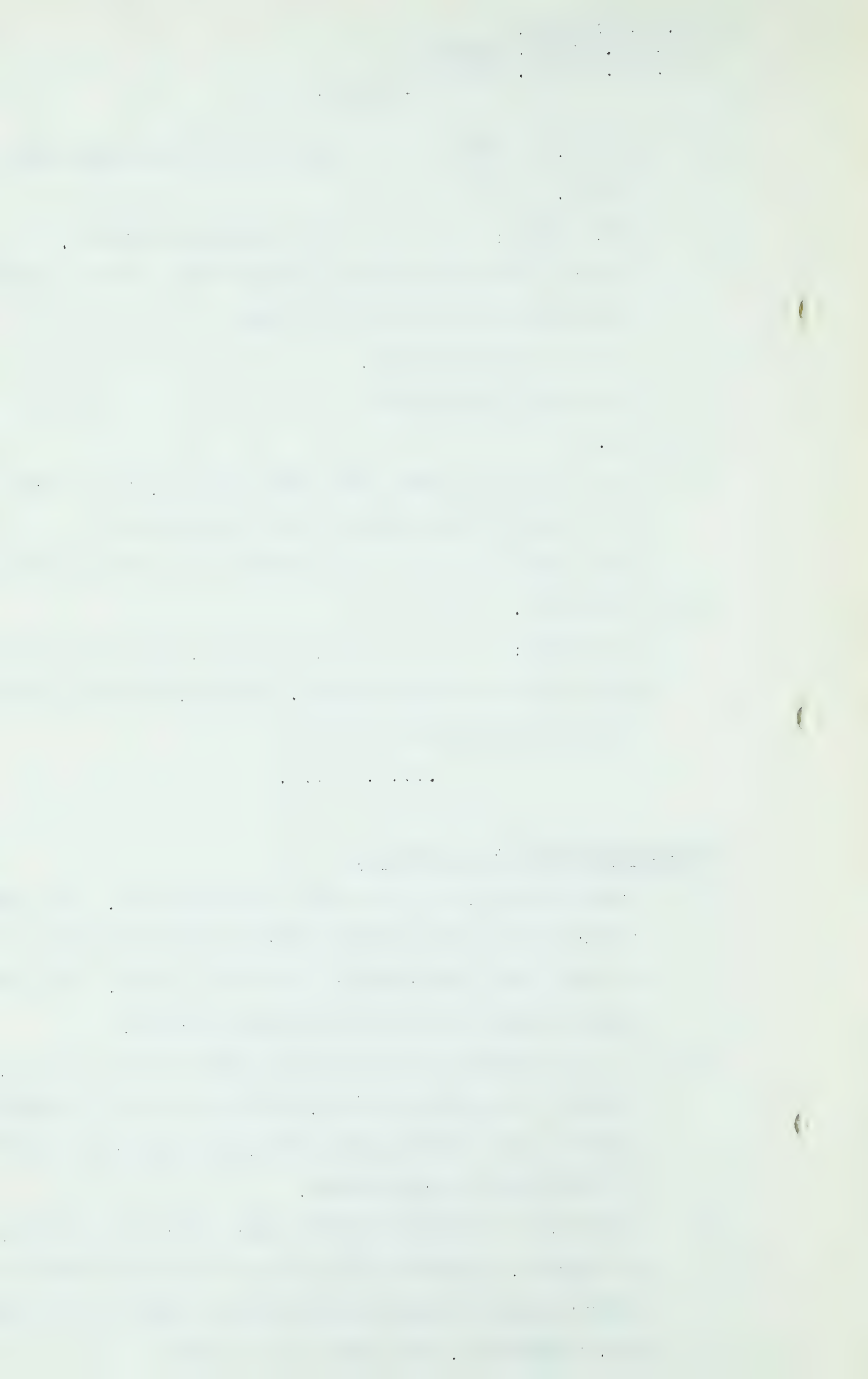
.....

RE-EXAMINATION BY MR. PORTER:

Q Turner Valley, - I will put it another way. The existing sources of supply to the Canadian Western become inadequate in what year, according to your Table here, Mr. Trostel? When do they have to go elsewhere for gas?

A It is a little difficult to answer that exactly, Mr. Porter, from this schedule, because we have Foremost included in the Pakowki Lake area, and you cannot quite pull it out from this tabulation.

Q I will put it to you another way: There is a stage, we are all agreed, in which the present sources of supply to the Calgary system become inadequate to take care of its peak and, ultimately, take care of its load?



E. G. Trostel,
Re. Ex. by Mr. Porter

- 3252 -

A Very definitely.

Q Very definitely?

A Yes.

Q Now, where is the closest available gas, as you now know it today?

A To the line?

Q Yes?

A It is the Pakowki Lake area.

Q It is the Pakowki Lake area?

A Yes.

Q Now, I notice that you go to Pakowki Lake and you go to Pincher Creek to supply those deficiencies?

A Yes, sir.

Q On Table 1, page 2, I observe that over a period of years under the heading "Annual Cubic Feet", 238 billion cubic feet come up through that line to Calgary?

A Come from Pincher Creek?

Q Yes, to Calgary?

A Yes.

Q In a period of 2, 4, 6, 8, 10, 11 years?

A Yes, sir.

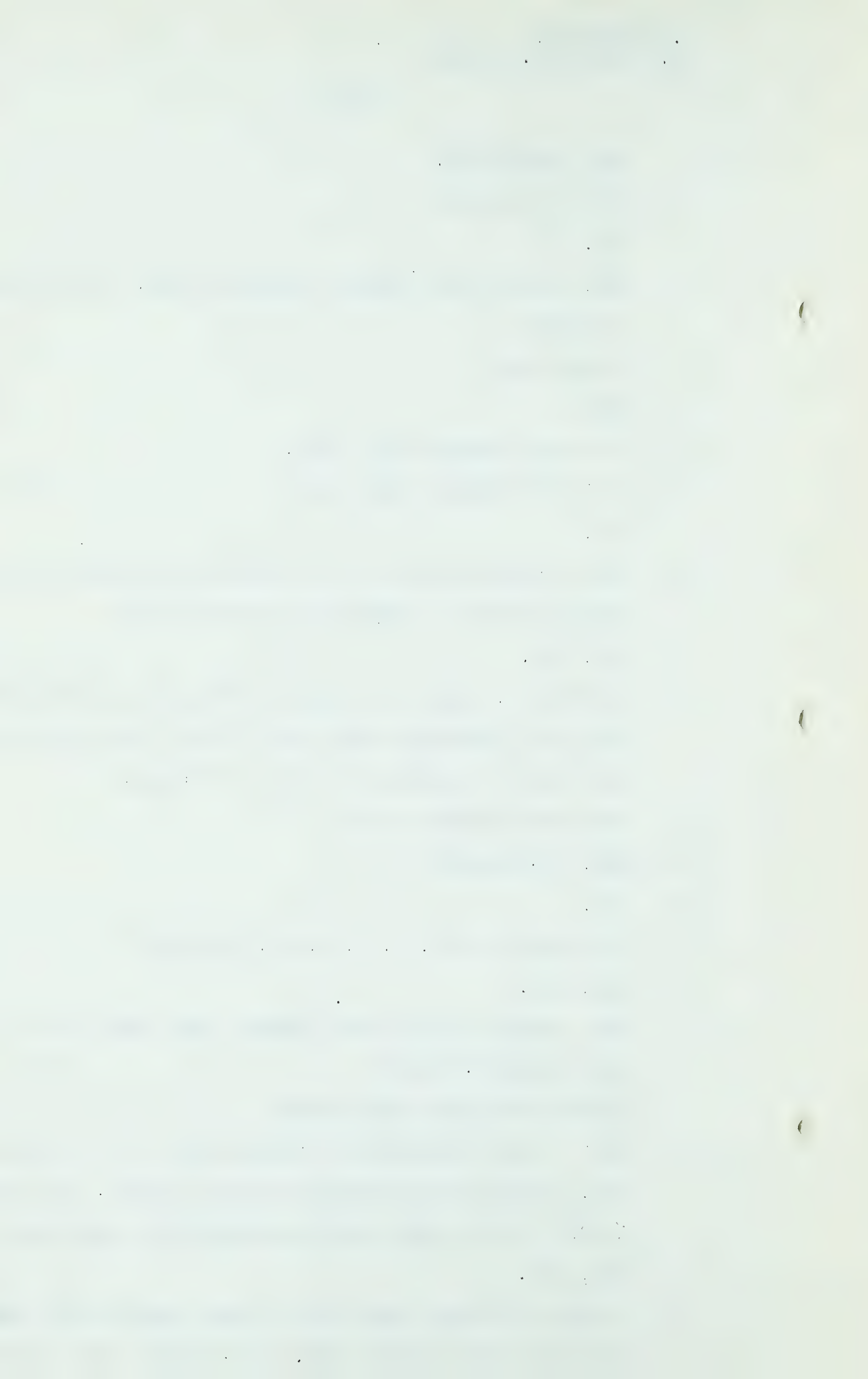
Q Now, can you give me the Pakowki Lake contribution in the same length of time?

A Do you mean those same years?

Q Yes? Well, let us do it another way. Let us do it another way. This is all Canadian Western system, and there is 365 billion comes up from Pakowki Lake and Chin Coulee?

A Yes, sir.

Q So that for that line that is built you have the sum of those two, 365 and the 238, for the line that is built from



E. G. Trostel,
Re. Ex. by Mr. Porter
Exam. by Mr. C. E. Smith

- 3253 -

Pakowki Lake to serve Calgary, including Pincher Creek supply?

A That is, both of those volumes would go through that line.

Q Both of those volumes would go through that line?

A Yes, sir.

Q Now, if Trans-Canada does not build, and no one else builds, and we do not develop any more gas, I assume that that is where we will have to get gas from for Calgary?

A It seems reasonable to me, sir.

Q And the pipe line will be exactly the same length if Trans-Canada builds it as it will if Western Canadian builds it, won't it, the same distance?

A Substantially.

Q The same distance between the points?

A As between the same points, yes, sir.

.....

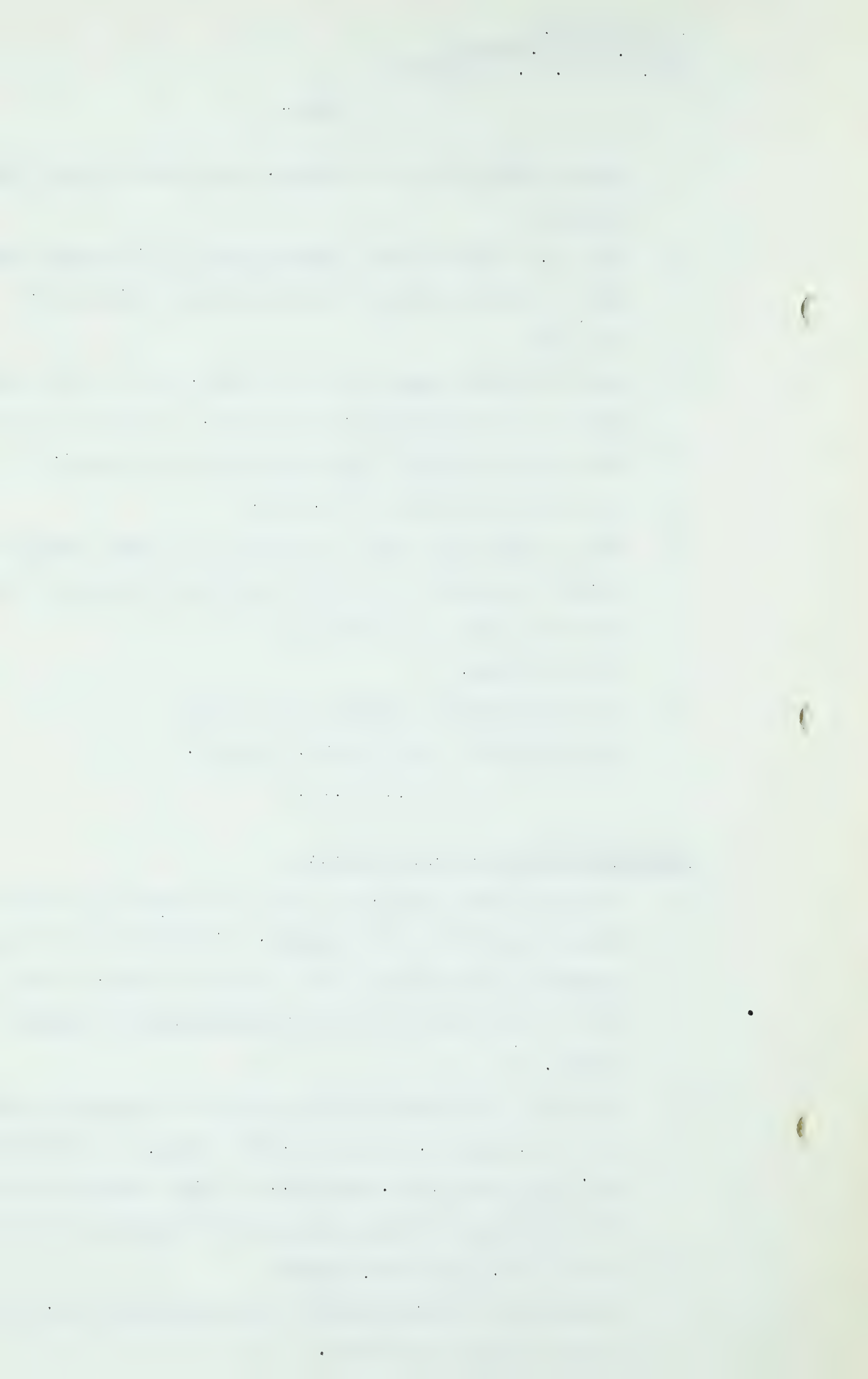
EXAMINATION BY MR. C. E. SMITH:

Q It is the same thing, no matter who spends the money, whether it is the Gas Company, or whether it is the oil companies, or anybody else, to get the gas, is that right?

A Well, I have known no way of increasing the amount of gas supply.

Q It looks like my gas bill is going to increase in my home, isn't it, export, no export, Gas Company or anybody else, isn't that true, Mr. Trostel, in your opinion at least? If we have got to have more gas at Calgary, we have got to pay for it, isn't that right?

A I think that may come unless the possibility Mr. Porter suggests should work out.



E. G. Trostel,
Exam. by Mr. C. E. Smith
Exam. by Dr. Govier

- 3254 -

Q We will be paying the money, if somebody puts in the line, and Mr. Blackstock will increase the rates, isn't that true? Isn't that very likely to be true?

A Yes.

Q Whether it is Mr. Steer who puts the line in or Mr. Porter, we have got to pay more money for gas here soon, in your opinion?

A I do not see how you can avoid it.

Q I am glad you said that out loud.

MR. MILVAIN: You should burn coal.

MR. C. E. SMITH: Burn coal?

MR. MILVAIN: Yes.

MR. C. E. SMITH: Well, I have got the old grate in my furnace yet, if you do not charge too much.

THE CHAIRMAN: Mr. Milvain, any questions?

MR. MILVAIN: No questions, sir.

.....

EXAMINATION BY DR. GOVIER:

Q Mr. Trostel, I wonder if you could help me relate the figures which Mr. Shattuck presented, having regard to the peak requirements of the Trans-Canada system with the figures which are presented here in your exhibit? I have been trying to do it and I have been able to partly, but not completely successfully. Mr. Shattuck's exhibit is Number 57, I think that is the number.

A I would appreciate it if somebody would let me have a copy of that, as I do not seem to have one.

Q I was looking at Table 2, Mr. Trostel, and I am not sure whether that is correct, the Table that follows Sheet 7, or page 7, I mean. It follows the page 7 amongst the

E. G. Trostel,
Exam. by Dr. Govier

- 3255 -

Tables, Mr. Trostel.

A I seem to be lost. Yes, I think I am located now.

Q I was also looking at your Table 7, which is page 14 of your exhibit, I think that is correct?

A I believe the exact figures which I use were given to me directly by Mr. Shattuck, and they were based to start in with on the figures in Table II that start out with the Annual Requirements, 88.6, 98.1, 108.7 and so on. And then he interpolated to me what the effect would be on the system when Winnipeg, St. Boniface, Transcona, and Regina, these cities and towns and villages, are taken into account, and they are the figures that appear on Table V, page 2 of the same Exhibit.

Q The figure 82,168?

A No, just above that, 8.748.

Q Yes?

A That figure of 8.748 we took as the first construction year of the pipe line, in other words, before the pipe line is completed, that it would well have that low take, that is, 8 billion feet.

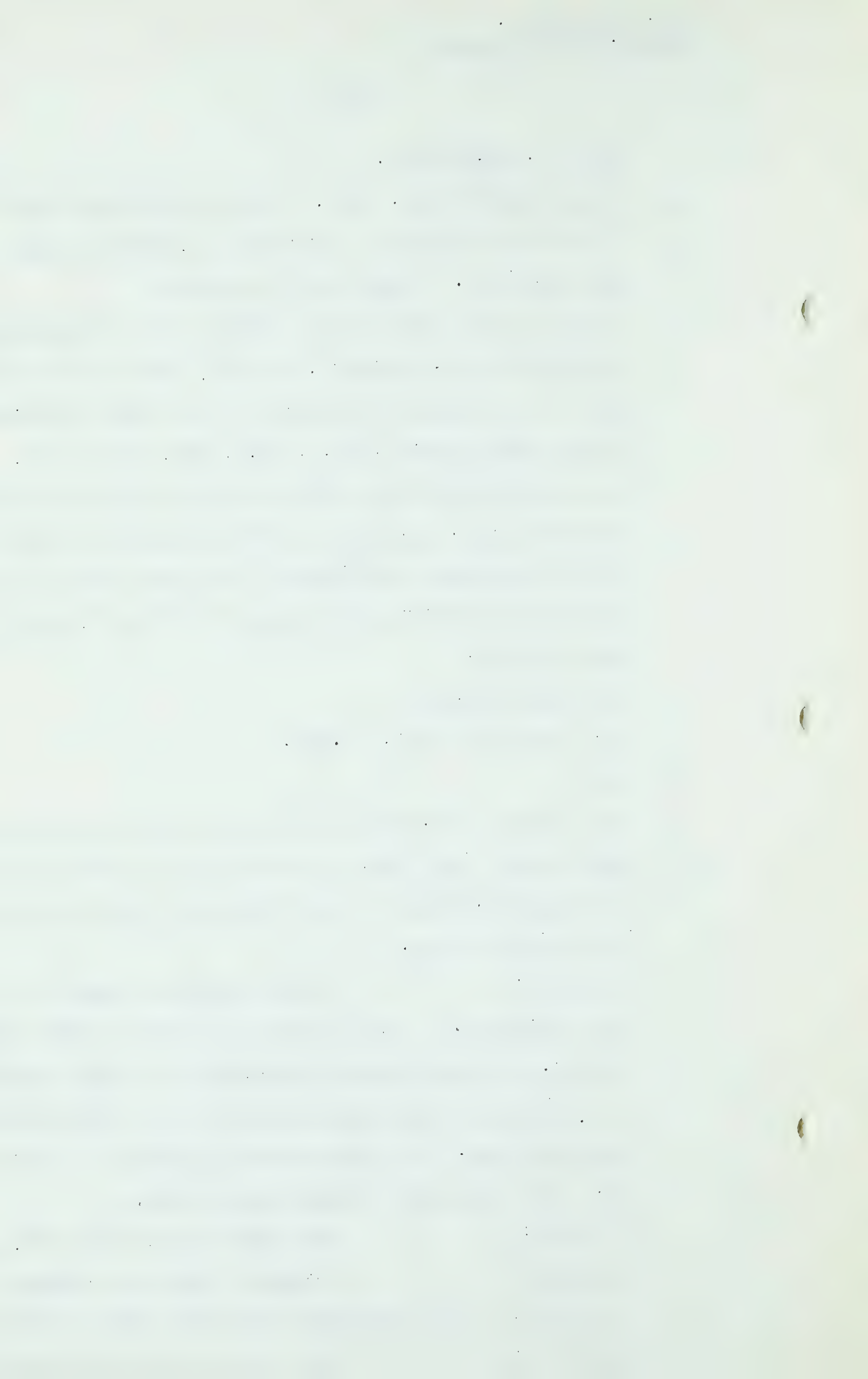
MR. PORTER: I think perhaps I might be able to help everybody. Mr. Shattuck has given us these figures revised, so that they were working on a common basis, and he did include contemplating some sales in the first construction year. He dumped those in and set it up in another way, and I have his revised figures here.

DR. GOVIER: That might help a good deal.

MR. PORTER: It gets it down to a common basis.

A I am sorry, I had presumed that those were in the record.

MR. PORTER: Well, they are in the record in the



E. G. Trostel,
Exam. by Dr. Govier

- 3256 -

old say, but they were revised as far as you are concerned.
This is part of Exhibit Number, I just forget what it is.

THE CHAIRMAN: Do you want to put it in as an
exhibit?

MR. PORTER: It goes into one of Mr. Shattuck's
earlier exhibits, his main exhibit, which was followed up,
and gave it in the 5-year period.

MR. S. B. SMITH: That is Exhibit 57.

MR. PORTER: 57, is it?

MR. S. B. SMITH: Yes.

MR. PORTER: It is Exhibit 57, and this should go
in as the revised Table II to form part of that exhibit.

MR. C. E. SMITH: One of the amendments already produced
and put in, or are you just distributing them now?

MR. PORTER: Exhibit 57 contains a page for which
this sheet will substitute to bring the figures on to the
same basis that Mr. Trostel used.

TABLE II REVISED SUBMITTED BY
TRANS-CANADA PIPELINES MARKED AS
PART OF EXHIBIT 57.

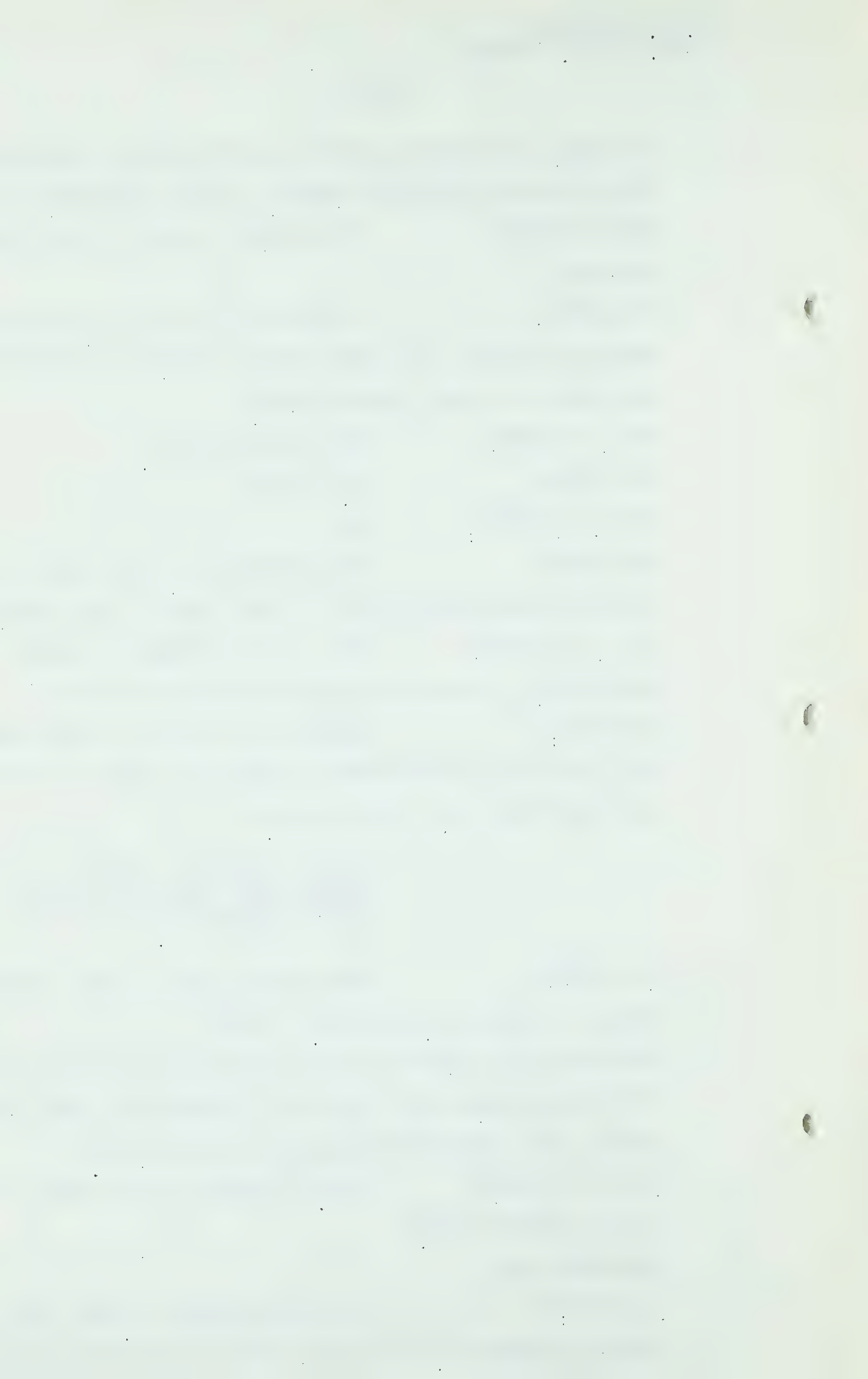
Q DR. GOVIER: This is the page that you were refer-
ring to at first, Mr. Trostel, is it?

A These are the figures for the first five years which Mr.
Shattuck gave me, and I have not followed the exact presen-
tation, as I understood they were in the record.

Q MR. C. E. SMITH: But Dr. Govier did not have it up
to the present moment.

A Apparently not.

Q DR. GOVIER: I saw this figure of 8.7, that did
appear in Exhibit 57. Will you look at your Table 7, page



E. G. Trostel,
Exam. by Dr. Govier

- 3257 -

14?

A Yes, sir.

Q And perhaps we could refer to column 2?

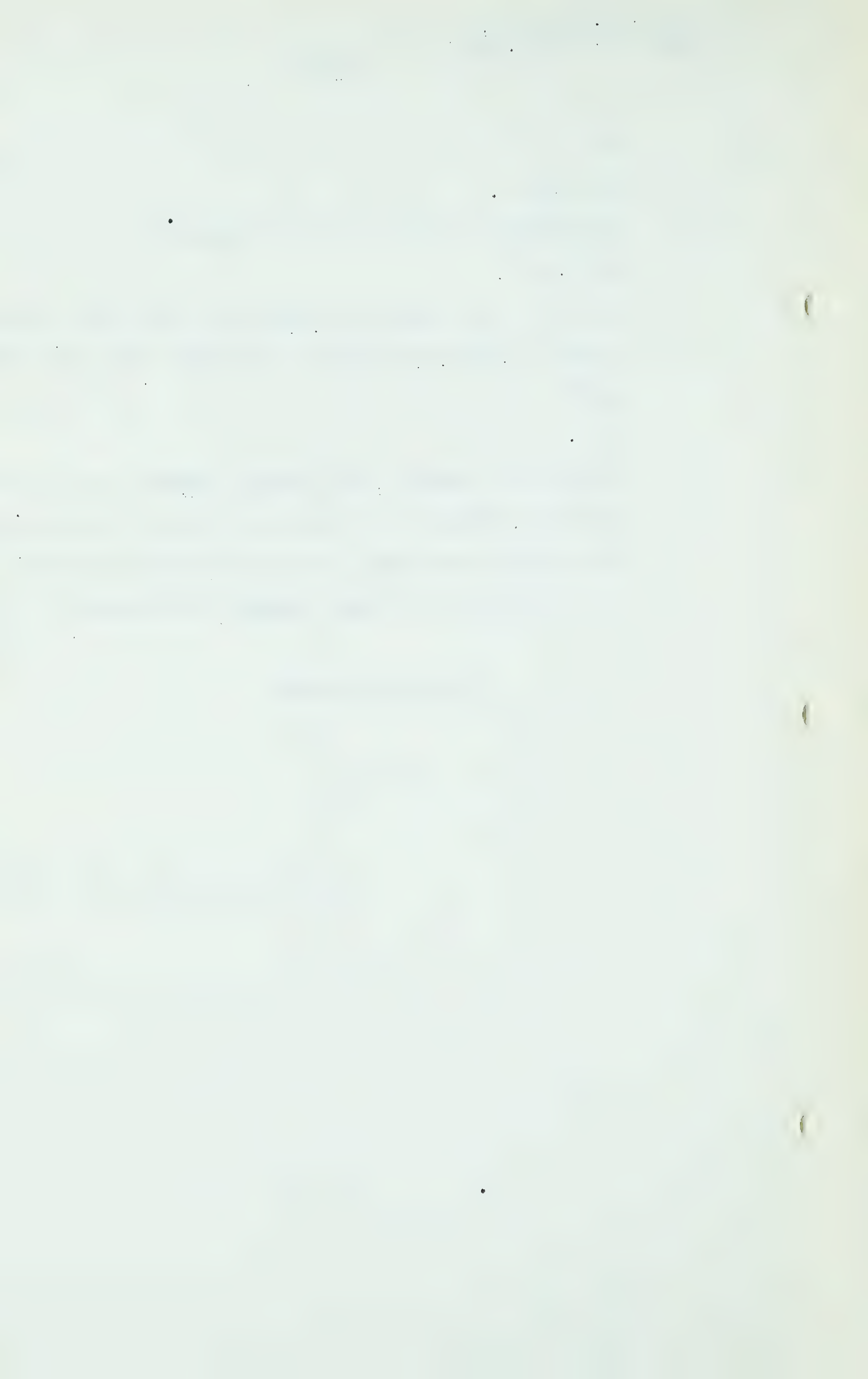
A Yes, sir.

Q Now, I see the figure 8.7, and the figure 89.1 also in column 2, 108.7, and 113 in the first, third and fifth years?

A Yes.

Q And when we consider the peak-day figures too, Mr. Trostel, which Mr. Shattuck has given on Table II revised, when I come to consider them, I am in difficulty there as well, and I wonder if you would explain that to me?

(Go to page 3258)



E. G. Trostel,
Exam. by Dr. Govier.

- 3258 -

A May I write this down so I can get a comparison? It will just take a second. Are we speaking, Dr. Govier, of the figures which appear on table 2 revised to peak for the first winter and second winter?

Q Yes.

A That bothered me too but I believe the answer is this - I do not like to interpret somebody else's exhibit, but I believe the wording somewhere in there states that is the firm requirement. The peak for the firm load. I believe you will find that these peak-day requirements are less than the average daily throughput of the line.

Q That was one of the things that bothered me, as a matter of fact.

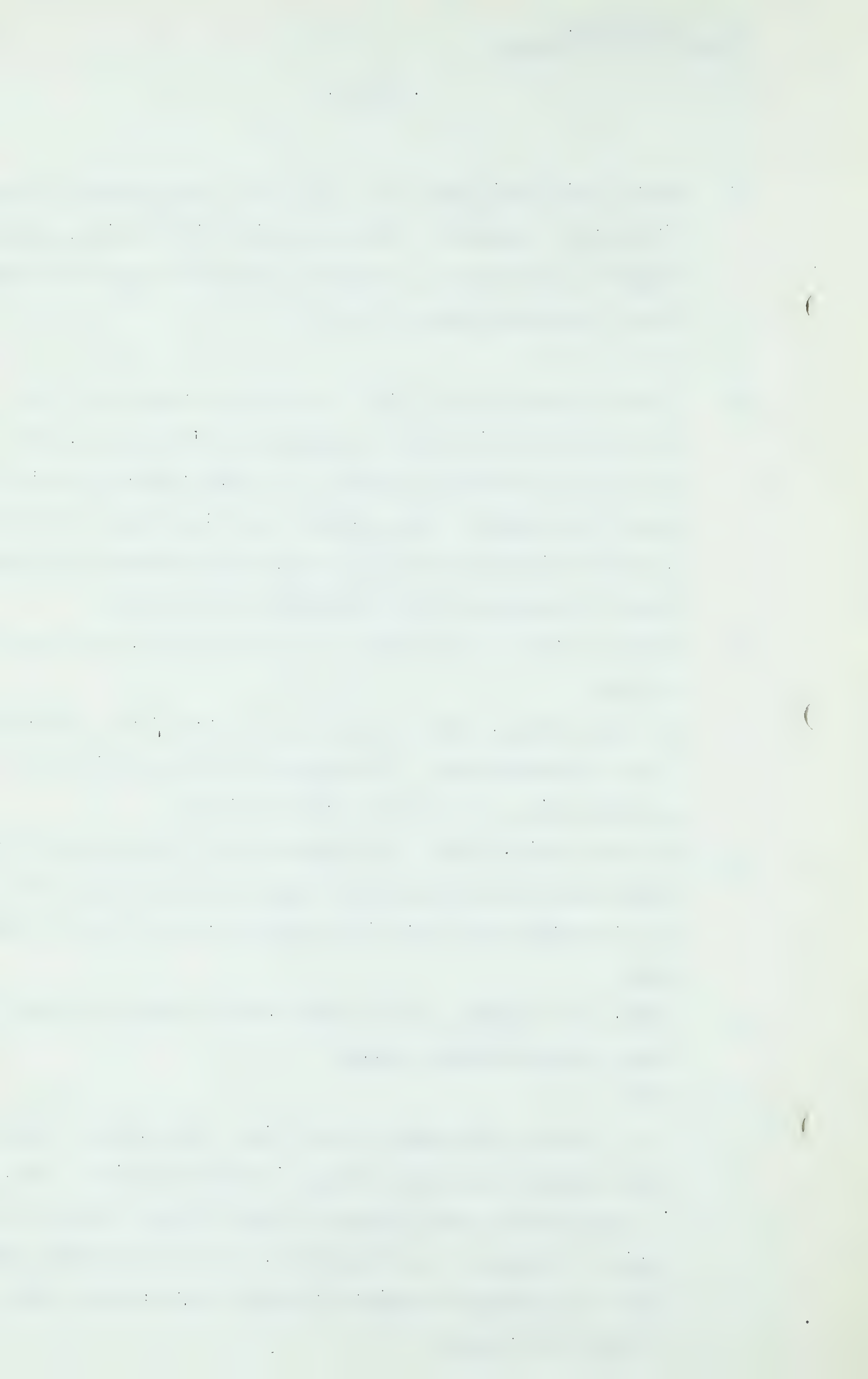
A In other words, that is the peak for the firm connected load, is my understanding. It happens to be less than the total average daily, due to the interruptible.

Q On that basis, then, the figures of Mr. Shattuck are the peak after the interruptible load has been shaved off. Can you correlate them with the figures on your table 7, Mr. Trostel?

A Well, for example, in the first winter where it shows a total of 159 million a day . . .

Q Yes?

A . . . actual throughput of the line, that should conform to 1954 wherein the daily average is 255.9 million a day, which is comparable to the figure of 89.1 billion per year on table 2 revised. In other words, these peak values are less than the average throughput because they are only the peaks of the firm demand.



E. G. Trostel,
Exam. by Dr. Govier.

- 3259 -

Q So that for practical purposes the line would be serving winter peaks which would equal those of Mr. Shattuck, plus that portion of the interruptible load which do not have to be shaved off, is that right?

A That is correct, which would be in the year 1954 an interruptible in the amount of 255.9 less 159.

Q In that sense the purchases of gas would be on a 100% load factor basis, is that correct? The purchases?

A You are beginning to get beyond my phase of where I am 100% familiar with this operation, Dr. Govier. But that sounds correct to me. These are questions which I hate to answer for Mr. Shattuck.

Q I am really looking at your table now and not Mr. Shattuck's.

A O.K.

Q Perhaps I can put it this way, that the amount of gas gathered in the Province will be the same every day of the year, is that what your table shows?

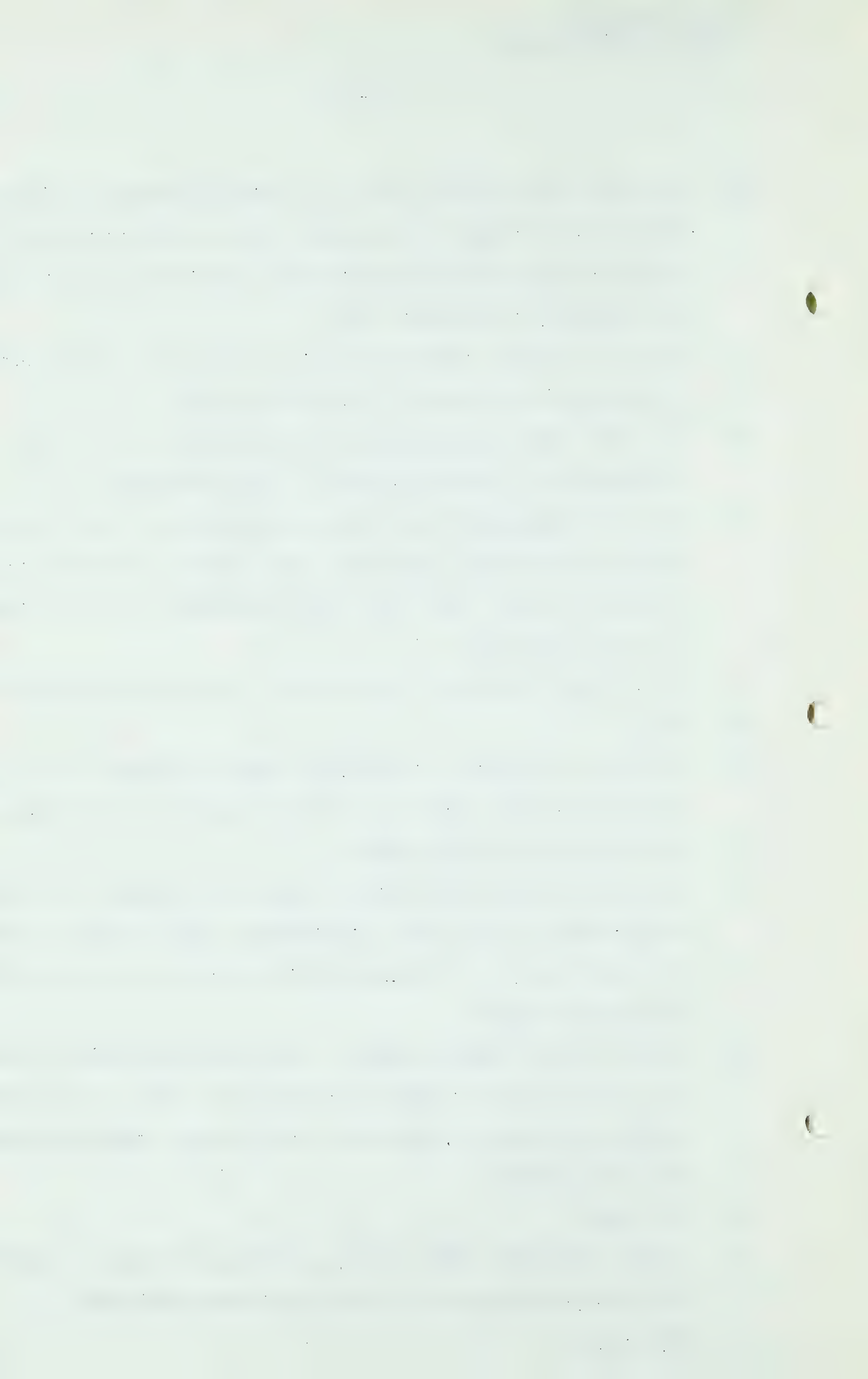
A It merely shows that that is the daily average. I am sure there will be some minor variations, although the intent, as I understand it, of Trans-Canada is to run at an extremely high load factor.

Q That is what I had in mind. I did not mean exactly the same, it will be plus or minus a little bit. That is the average during the year and there will not be any large percentage of fluctuation?

A No, sir.

Q As you explained this morning, this load factor is really the per cent capacity of the pipe line operation?

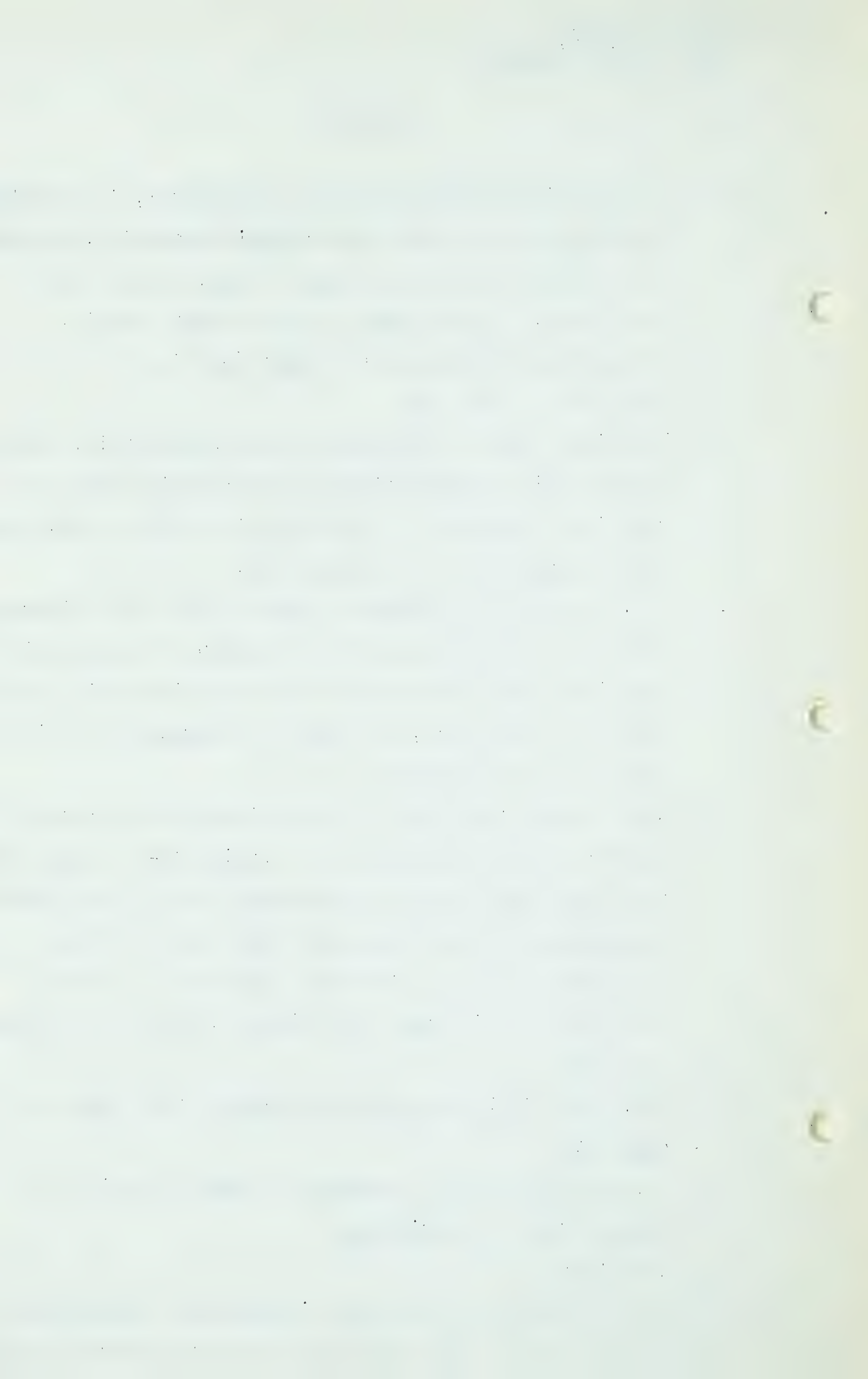
A Yes, sir.



E. G. Trostel,
Exam. by Dr. Govier.

- 3260 -

- Q I wonder if you would help me, Mr. Trostel, in correlating these figures with Mr. Warterfield's submission, exhibit 82. I have been able to find some of them, but not all.
- A I am sorry, I do not have a copy of that exhibit.
- Q I would loan you mine but I might want it.
- A Yes, sir. I have one.
- Q The first thing I would like to get straight is, Can you tell me what daily average figure Mr. Warterfield has used for his capacity calculation? The Provincial total or what year it was designed for, do you know that?
- A Yes, these are the figures I gave to him. The figures which I gave to him were based on the maximum average daily during the first twelve years on a point by point basis, just a field by field basis, and then he integrated them in his pipe line calculations.
- Q And what was the total of those figures, Mr. Trostel? Mr. Warterfield has marked his drawing "S-2 Average Take from the field" but he has not marked the total amount of gas gathered on the line and I want you to do that.
- A As a matter of fact I have not added them up either. It seems to me it is about 330 million a day, or something like that.
- Q Now, would it be in any of the figures that appear in table 7, page 14?
- A No, not necessarily. Perhaps it would be easier if I started from the beginning.
- Q All right.
- A And tell you how these were arrived at. Mr. Warterfield asked to have a rate for more or less the start of operations



E. G. Trostel,
Exam. by Dr. Govier.

- 3261 -

from each field which we thought would be produced from each field. In certain of the fields, such as, in fact, the entire composite B group figures I gave to Mr. Warterfield, which I presume appear on this map, are those which appear in the five fields on table 10, page 20.

Q If you could just give me an illustration?

A Yes, sir.

Q That would be sufficient.

A For example, the Boyle-Mustang-Amisk Lake, the peak figure of 12 million, you see that in parenthesis after Boyle-Mustang-Amisk Lake on the sketch, Mr. Warterfield's exhibit which is labelled "Trans-Canada Pipe Lines Limited Diagrammatic sketch Gathering System, Province of Alberta".

Q Yes, I have it.

A And up on the upper right-hand corner a little triangle Boyle-Mustang-Amisk Lake, parenthesis 12 . . .

Q That is the figure 12 on your table?

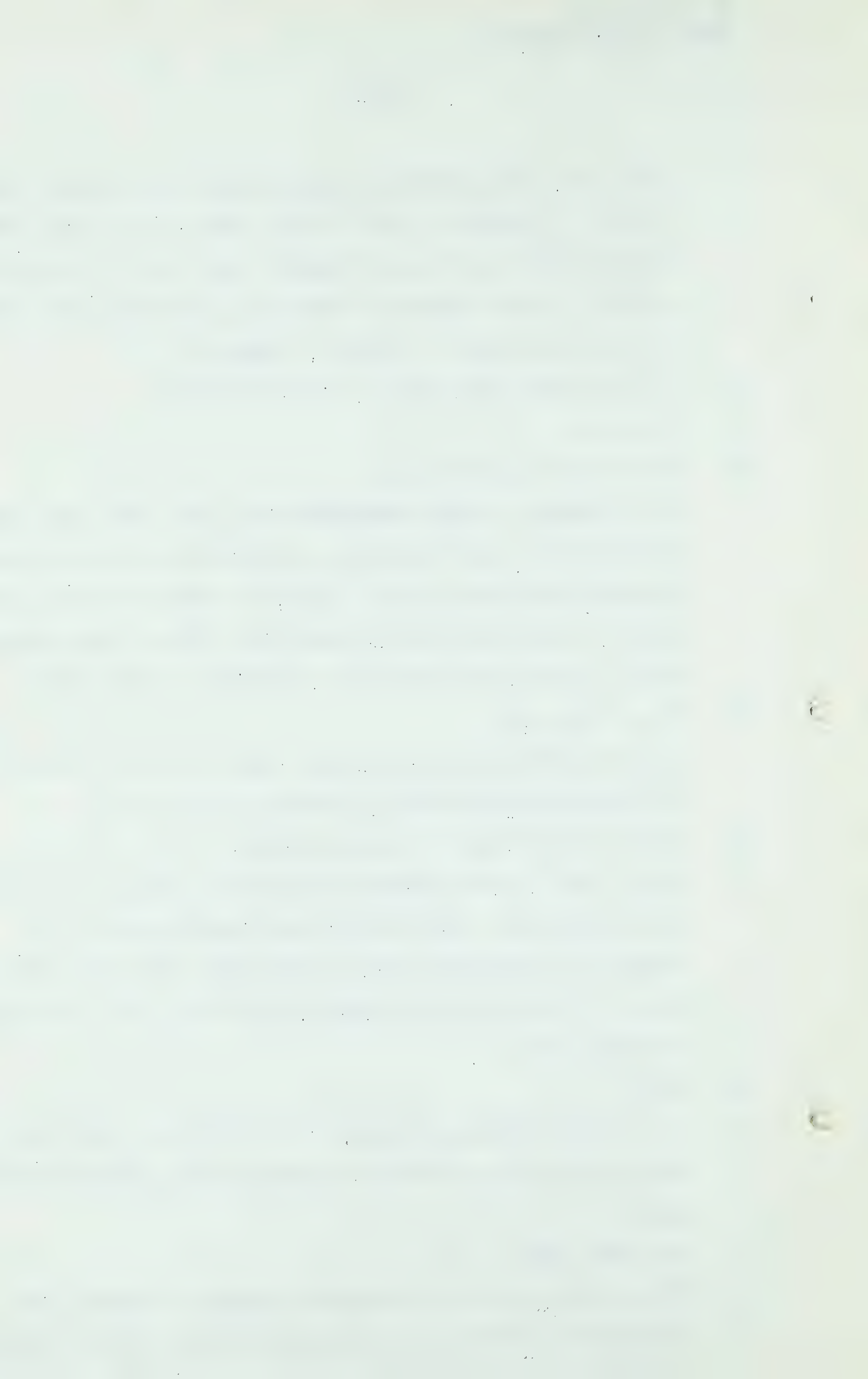
A Yes. That is the maximum which was run through the 10-year period from that line in this particular case, or the maximum contemplated going through that line from this field. Well, if you take Jarvie-Dapp, and if you refer to Column 7 of table 10. . .

Q Yes?

A . . . that builds up to 5.3 in the fifth year as shown there. That then is the 5.3 which is shown by Mr. Warterfield's map.

Q And the others . . .

A That is true over the composite B group. However, the composite A fields had to be recalculated back and the rate prorated back according to the manner in which we produce



E. G. Trostel,
Exam. by Dr. Govier.

- 3262 -

from composite A. For example, if you take table 7 and you see composite A fields produce in that group about -- I think we used 159.9 million a day. Then those figures were distributed back to the fields on a percentage of reserves basis, distributed back field for field, and it came out that Castor had 5% of the total that we are talking about, or $8\frac{1}{2}$ -- I am sorry, I said 155.9 but that should be 162.7, which is in the 1961 figure.

Q But again based on the first 10 years?

A Yes, it took the peak -- I cannot find that figure momentarily, but it is 162.7 and I prorated that rate 162.7 back over the composite A field on a relative reserve basis. For example, the Castor reserves amounted to 5.10% of composite A group reserves available for sale and 5.2% of 162.7 is 8.5 million, which is assigned to Castor.

Q I see.

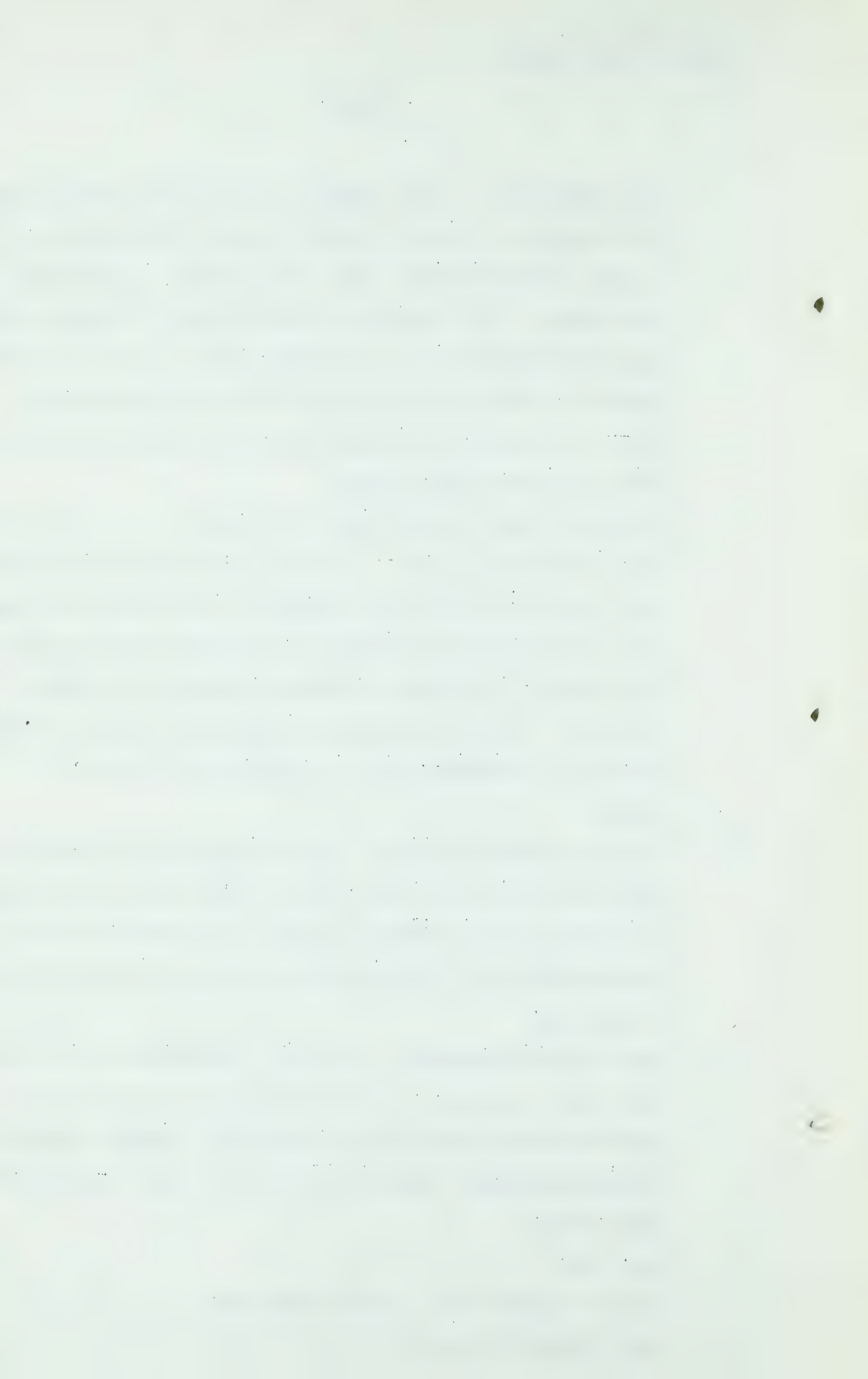
A And so on down the line. Those figures should add up. You asked me about that total, and it will add up the composite A fields to 162.7 million a day. I do not have them here for the composite B. I would have to add up the figures shown on the map.

Q That is not necessary. I think I understand how you got the A and B groups, but can you tell me about some of the others that are not in the composite. Pincher Creek is straight forward. That is 113 on the chart S-2 and 113 in your table?

A Yes, sir.

Q And that pretty well covers them all?

A Yes, I guess it does.



E.G. Trostel,
Exam. by Dr. Govier.

- 3263 -

Q Whitelaw and North Tangent is the only other one?

As a matter of fact that rate was 87.9 that I gave to Mr. Watterfield. I do not see that it appears on this particular sketch.

MR. PORTER: There is another sketch, is there not? No, I guess it is in the earlier exhibit.

A Yes.

Q Which did not have any figures on showing Whitelaw alone.

Q DR. GOVIER: What was the figure, Mr. Trostel?

A 87.9. That figure comes directly out of . . .

Q . . . column 10, table 7?

A That is correct. It would have to be somewhat enlarged in 1965 if the rate goes up to 105. I date that for 12 years from the start of Trans-Canada's operation. I believe that corresponds to the 87.9 figure.

Q I see. Now, Mr. Trostel, there is another matter I would like to discuss with you and it is in connection with the economics of some of these lines. You did mention to Mr. McDonald that it was not fair to look at one extension by itself, and that the entire project ought to be considered together. I would like you to know that I appreciate that point of view. However, I would like to get your opinion on some of these extensions which seem to be rather distant extensions for rather small amounts of gas. It would seem to me that if that process is carried on too far, you might get to the point of diminishing returns. You cannot keep indefinitely adding highly expensive gas, can you?

Q No, sir. I presume you would have primary reference to the line out to Boyle-Mustang-Amisk Lake area.

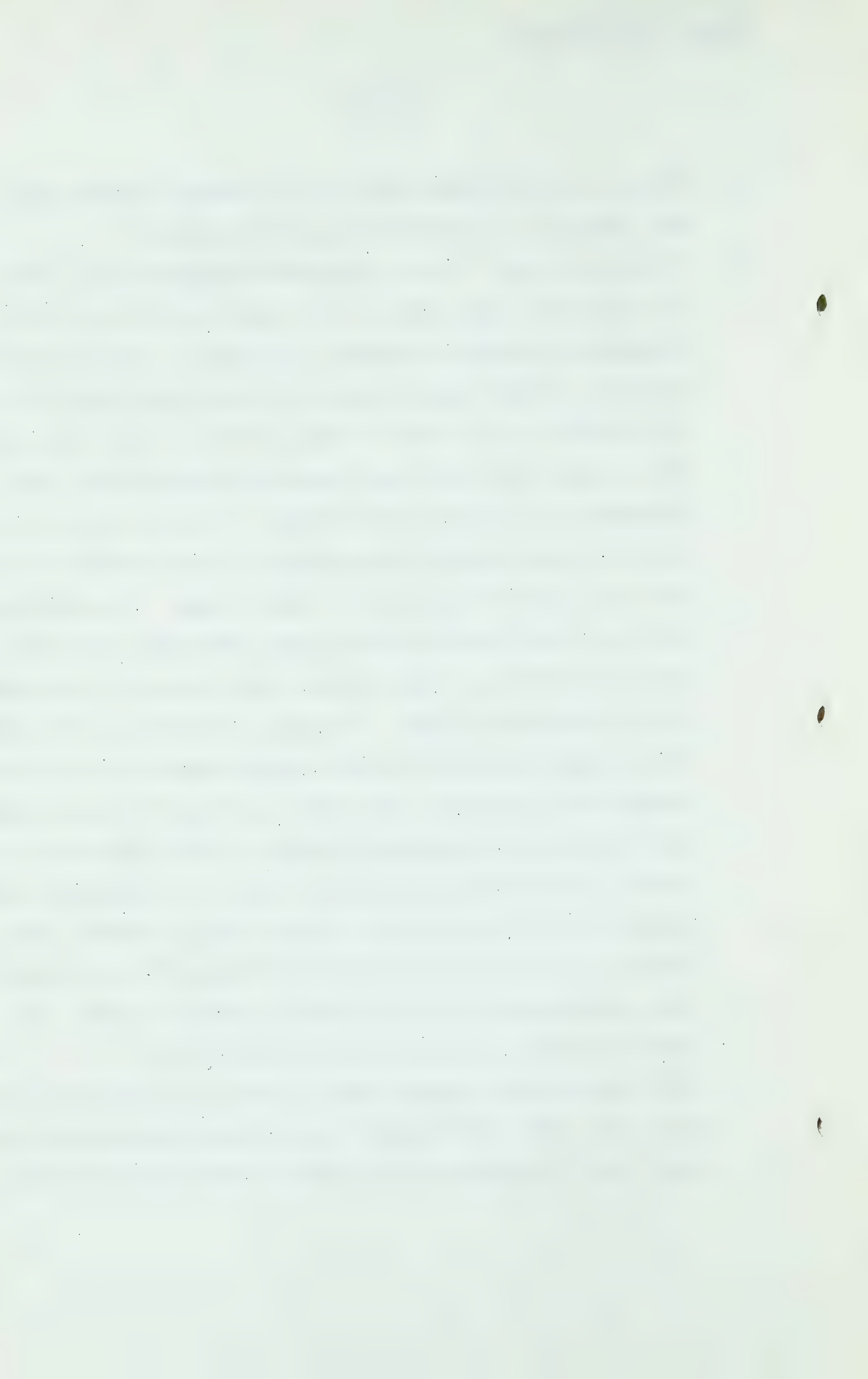
E. G. Trostel,
Exam. by Dr. Govier.

- 3264 -

Q If you would discuss that one and perhaps the Whitelaw line, Mr. Trostel, I am sure that would be helpful?

A I believe as far of the Boyle-Mustang-Amisk Lake extension is concerned, that reflects to a great extent the Trans-Canada's or Canadian Delhi's confidence in finding additional reserves in that area to the effect that they are and will be spending a good deal of money in the Lac la Biche area this winter, and they have confidence and believe that there will be more gas to be added. It is no test -- well, I do not know whether you could get at the economics of a spur, you have to look at the whole thing. Nevertheless the fact that Canadian Delhi views favourably that Lac la Biche area is one of the factors that led to the selection of this particular spur. It was, of course, in selecting the fields to go into the whole gathering system and provide enough gas to make the pipe line go, or as far as we can, and that was the fundamental basis for the selection of the fields, in attempting to put the line at a minimum of expense through the gas areas where the gas could be taken care of. We will be going through the Leduc area and so forth and that some solution gas, perhaps from the gasoline plant, can be picked up that otherwise would be blown out.

Q Have you made any computations or have you any information as to the cost of bringing in that Boyle-Mustang-Amisk Lake gas, say, to Edmonton or to the junction near Picardville?



Everett G. Trostel,
Exam. by Dr. Govier.

- 3265 -

A I have not made them in great detail, sir. However, at one time it did not run through most of these things and they all appeared feasible to me. You expressed the cost of a spur line in terms of a reserve which will be produced through the line. You can express that in terms of cents per Mcf. for cost of gas just for that physical thing and it is of the same order of magnitude, I would imagine, as the development cost in the field or less in nearly every case. I do not like the idea of trying to take one segment because the whole thing is together as a unit or the line can not go.

Q Well, perhaps we might consider the economics of another line which I believe you have suggested would be built as a separate unit, in any event, and that is the line that Canadian Western might build to Pawkowi Lake. Have you considered that at all?

A No, sir, I have not made any calculations on the economics of that line.

Q I wonder if we could get some approximate figures so that you could at least give us an opinion as to what you think -- I have forgotten which of your tables shows the amount, Table 1, I guess.

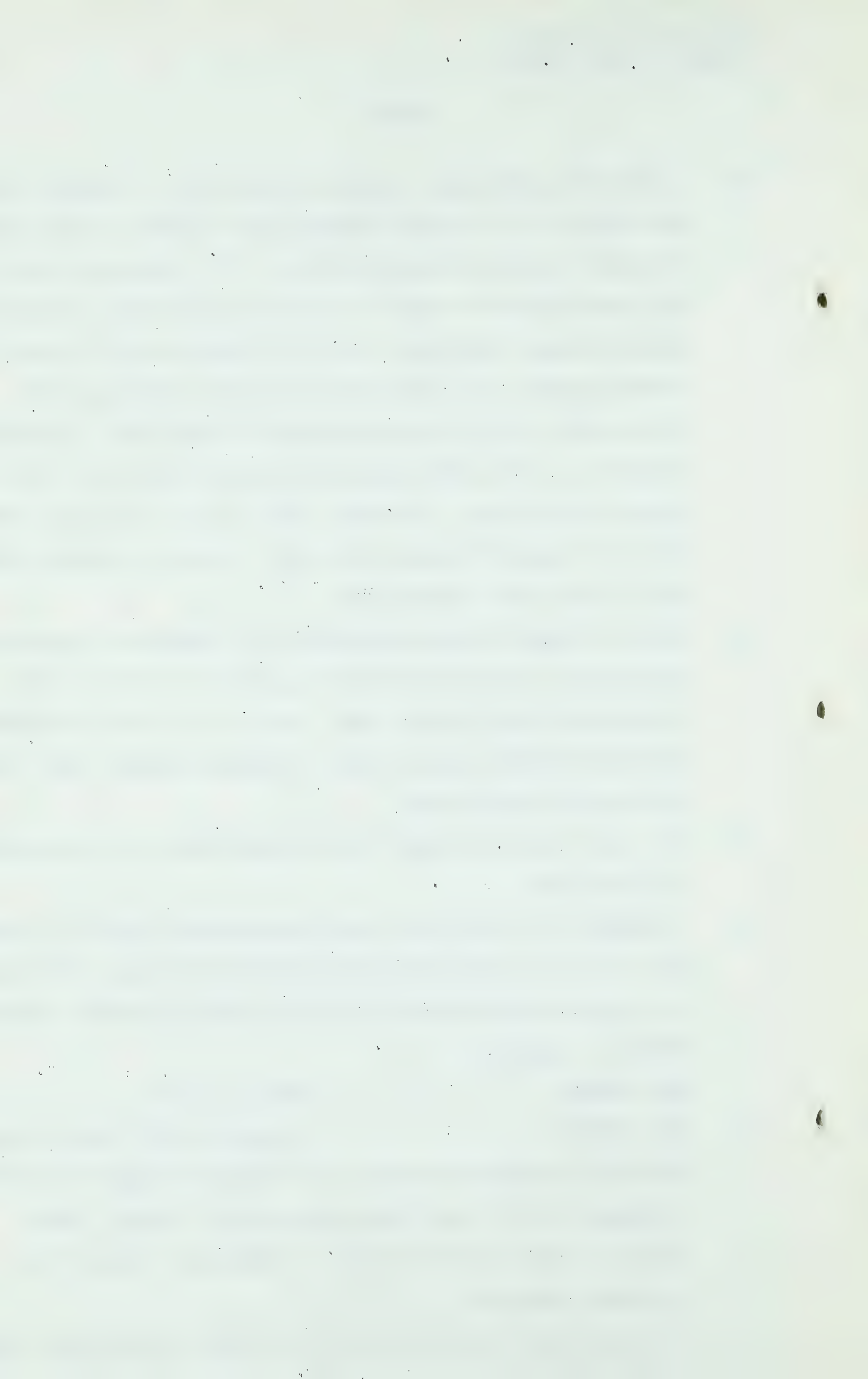
MR. PORTER:

Table 1 is it.

Q DR. GOVIER:

I suppose that line if built within the next five years or so would probably be built at a capacity of 30 or 40 and subsequently looped. What would you think, Mr. Trostel, or would you build it at a larger capacity?

A I do not know the capacity of the lines in there now, as a matter of fact, sir.



Everett G. Trostel,
Exam. by Dr. Govier.

- 3266 -

Q Supposing we just assume that the line that is now in there would be of no use because, I believe, the Canadian Western people are strongly of that opinion. We might make that assumption.

MR. PORTER: I would not like to make that assumption. It is in the rate base and I am paying for it.

Q DR. GOVIER: Mr. Trostel, could make the assumption and anything we arrive at would be subject to that assumption.

A THE WITNESS: Well, I am not qualified myself as an expert on cost of building pipelines and I really have not studied that field, Dr. Govier.

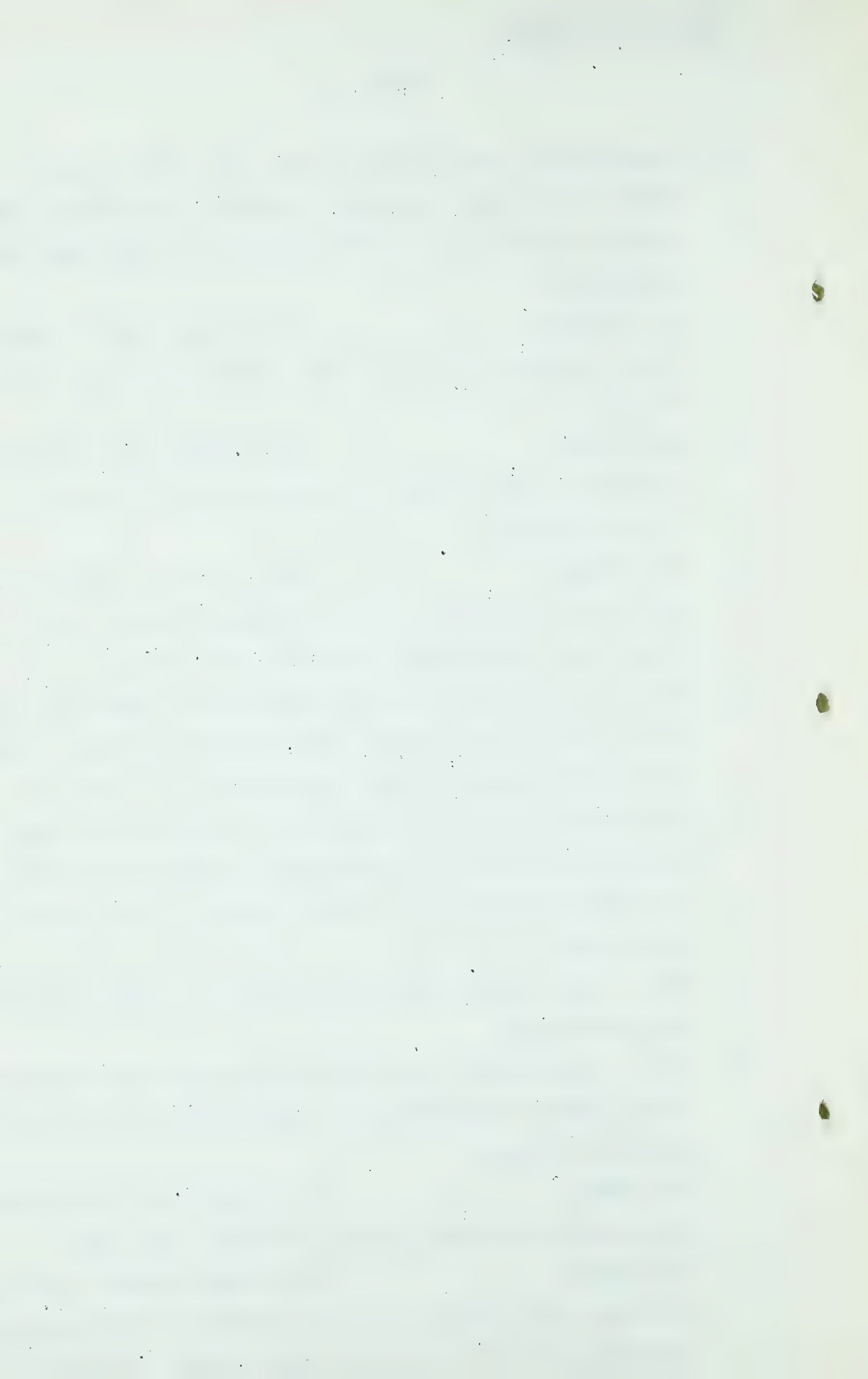
Q Well, it certainly is not my intention to embarrass you on the matter, Mr. Trostel, but you have to suggest that while this program is very illustrative it is none the less practicable and I would just like to know whether such an extension to Pakowki is practicable insofar as meeting the deficiencies of the C.W.N.G. system. I was hoping you could help.

A Well, I have never done any work on it. I will try to go along with you.

Q Well, I am afraid if you have not done very much work on it and have no information we won't be able to go very far because I haven't.

MR. STEER: Mr. Trostel and Mr. Warterfield should have been in the box at the same time.

Q DR. GOVIER: One thing we might do, Mr. Trostel, is to look at an exhibit which Dr. Hetherington submitted, it is Exhibit 6, and Mr. Goodall, you have a



Everett G. Trostel,
Exam. by Dr. Govier.

- 3267 -

spare copy of it there. I do not know to what extent this exhibit would be applicable, but perhaps you could take a look at it and tell me whether you think it would give us a rough idea of the cost of gathering that gas.

MR. PORTER: Doctor, there is one thing I think that perhaps we are overlooking, and that is that the Pakowki Lake extension and the Pincher Creek extension would join at some point, then go to Calgary, so that you would have the Trans-Canada Transmission Line coming out of Pincher Creek with its load, the Pakowki Lake one coming up to a junction with a line from the junction to Calgary, so that we are not going to isolate the Pakowki Lake throughput to a new or separate line.

DR. GOVIER: Mr. Porter, is that reflected on Dr. Warterfield's maps?

MR. PORTER: It is on one of the maps. He has a point of intersection on one of these maps but I can not find it at the moment because I have not the exhibit. I had him submit a map showing his gathering system and the Canadian Western and Northwestern. Mr. Steer was good enough to give us his map and the two went in.

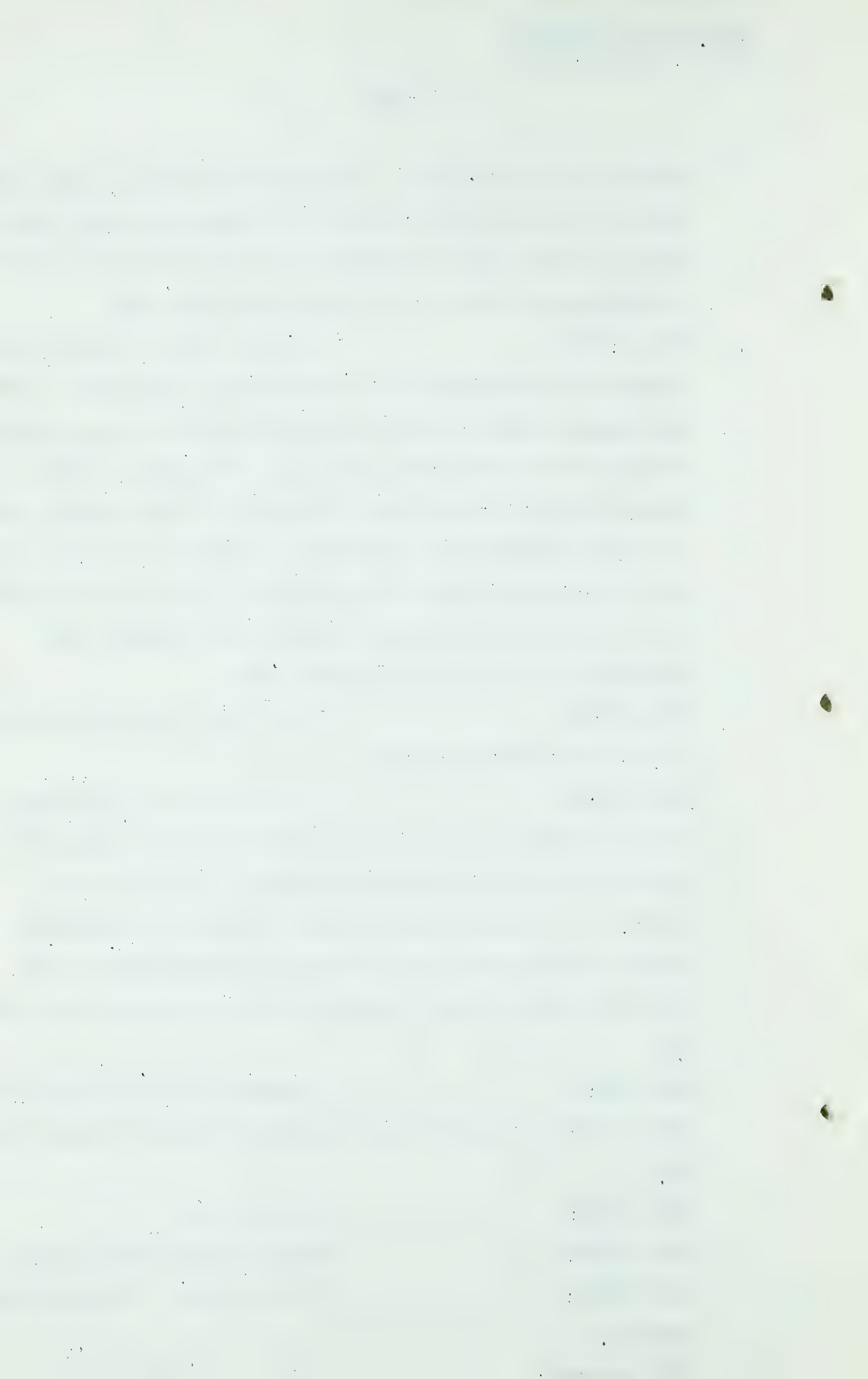
MR. STEER: I understood Mr. Trostel to say you were not proposing to gather Pakowki Lake gas at all.

MR. PORTER: Here it is.

DR. GOVIER: What is the number of it?

MR. PORTER: It is in 83. It shows the overlap.

THE CHAIRMAN: That is Mr. Harries'?



Everett G. Trostel,
Exam. by Dr. Govier.

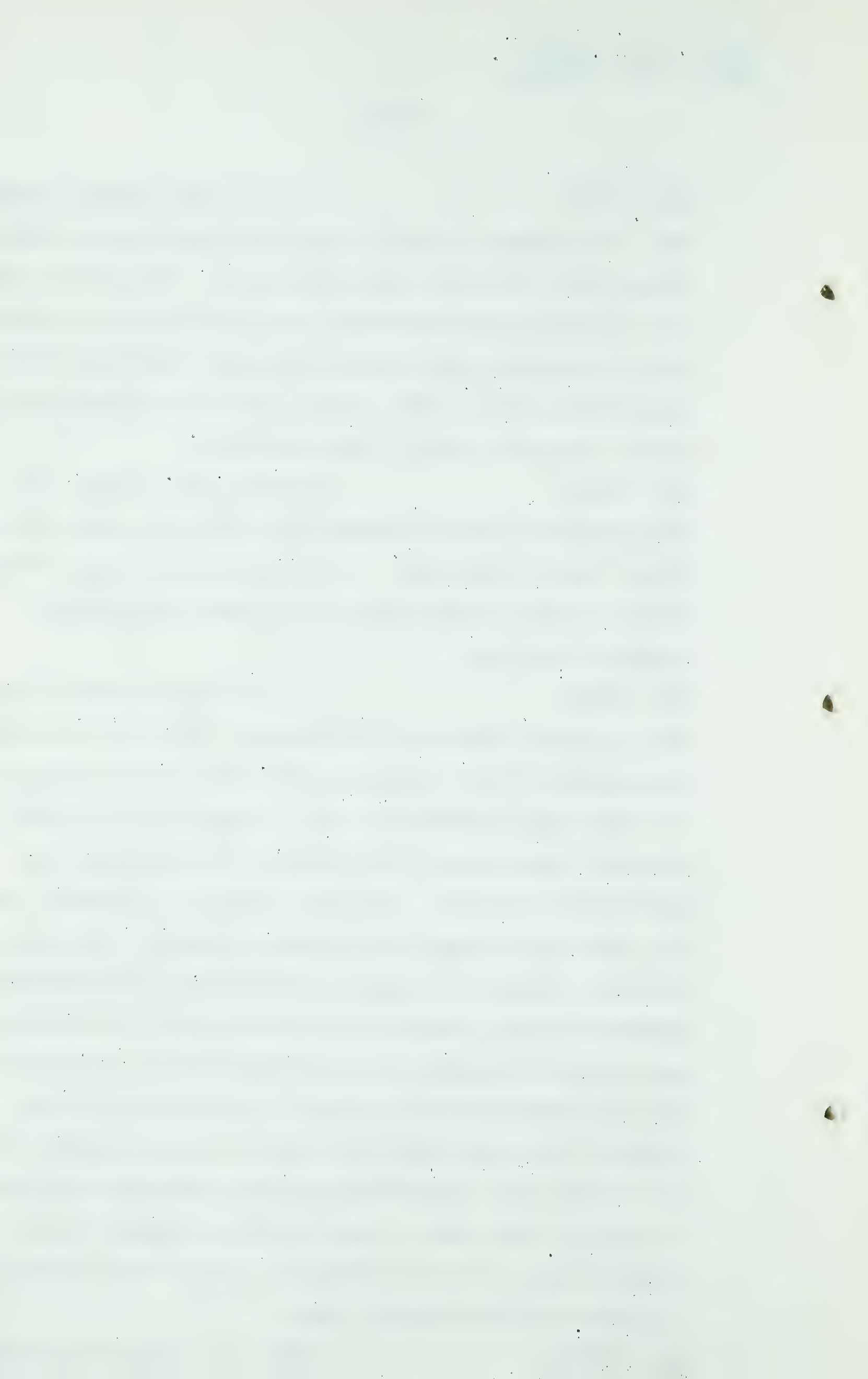
- 3268 -

MR. PORTER: It is in Mr. Harries exhibit, yes. The present lines are there and the proposed Trans-Canada line is there in the black line. There would have to be a Pakowki Lake extension but it is not to be assumed that it would be from Calgary to Pakowki Lake and serve only Pakowki Lake. That is the part in the assumption to which I thought I should draw attention.

DR. GOVIER: Perhaps, Mr. Porter, you could suggest a better assumption so that we could get a better idea of the cost. I still am not clear what Trans-Canada's idea is with regard to Pakowki Lake and now Pincher Creek gas.

MR. PORTER: Mr. Shattuck is still here and he has Mr. Warterfield's figures. Would it be more satisfactory if Mr. Trostel and Mr. Shattuck sat down and did some rough figuring on it? I am sure they can not do accurate figuring but the exhibit, as I understand it, contemplates Pincher Creek gas coming to a junction with the added line coming from Calgary, Pincher Creek gas going through to supply the Calgary deficiency, and ultimately Pakowki Lake gas coming up and joining at that junction and going to Calgary, my point being that the junction at or near Diamond City will enjoy the throughput of the Pincher Creek contribution as well as the throughput of the Pakowki Lake contribution, leaving Pakowki Lake gas to bear the cost only of the line from Diamond City to Pakowki Lake. It would divide the cost of that extension of Diamond City to Pakowki Lake.

DR. GOVIER: That is a proposition which has not been advanced by any of your witnesses so far.



Everett G. Trostel,
Exam. by Dr. Govier.

- 3269 -

MR. PORTER: The proposition is patent from a study of the exhibit to which Mr. Trostel has just testified because, as you see, the rate of take develops. I think it is apparent from Table 1.

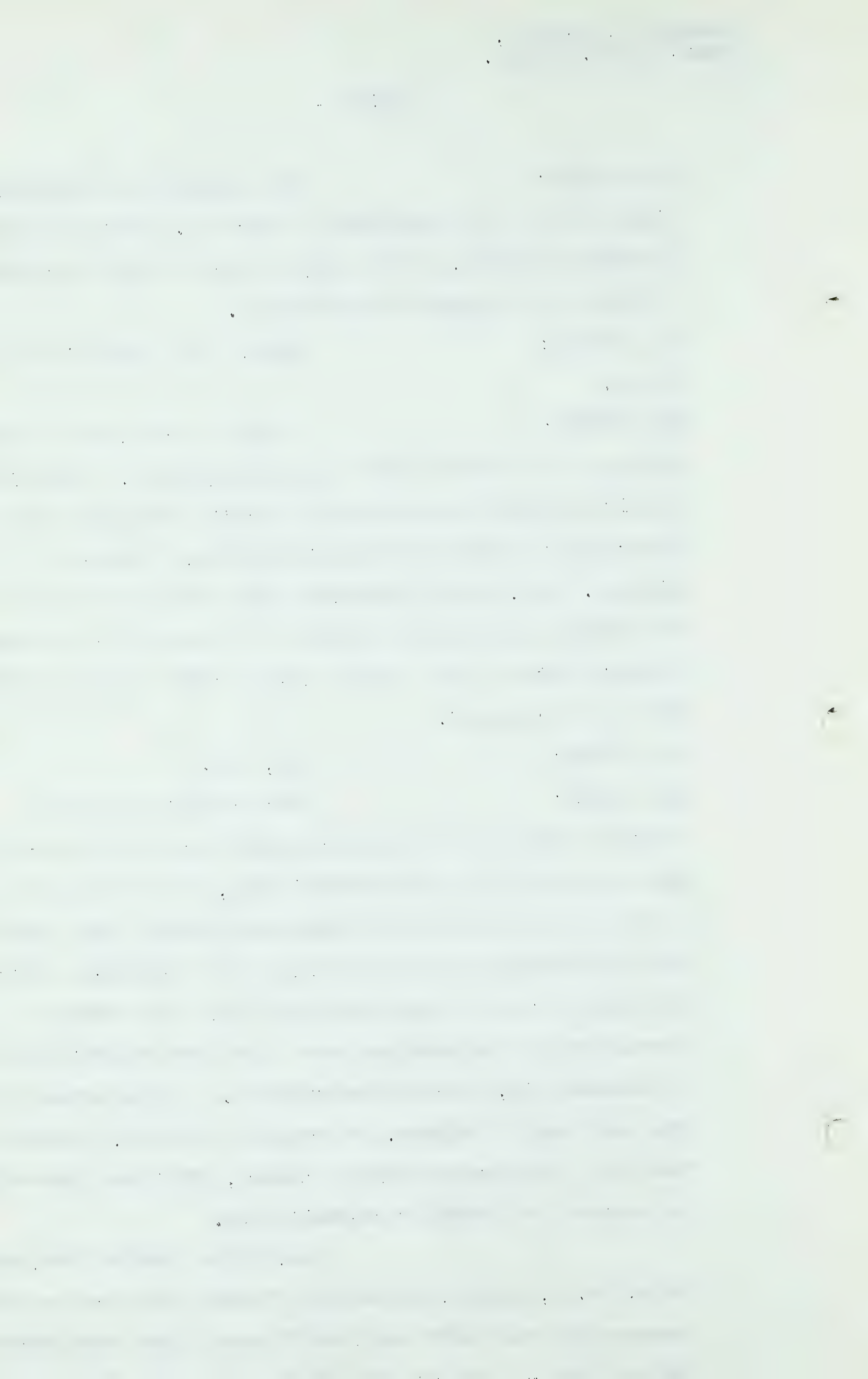
DR. GOVIER: Well, I am afraid it is not to me.

MR. PORTER: I can be wrong, but I can show you in a minute what I am talking about. The illustrative deliverability schedule for the Canadian Western Natural Gas Company distribution system, Province of Alberta. Now, this illustrates that from Chin Coulee in the Pakowki area there is going to be taken for the Canadian Western system in the period 1954 to 1980 a total of 365. That is in column 3.

DR. GOVIER: Yes, sir.

MR. PORTER: That has got to get to Calgary or get into the system somehow and to do that it goes through a line from Pakowki Lake, Chin Coulee, up to a point to contact with the Canadian Western line. Whether that is Diamond City or Bow Island is a mechanical problem relating to cost of building that line, so we have a throughput of that much gas on a line from Pakowki Lake to Diamond City, wherever we build it. To the extent that that gas goes to Calgary, it occupies the line, assists the line from Diamond City to Calgary, which may have to be extended or looped or re-built even.

Now, if we turn to the same table, No. 1, page 2, we look at Pincher Creek and we find between the years 1970 and 1980 Pincher Creek contributes 283 million -- I do not know whether it is million or



Everett G. Trostel,
Exam. by Dr. Govier.

- 3270 -

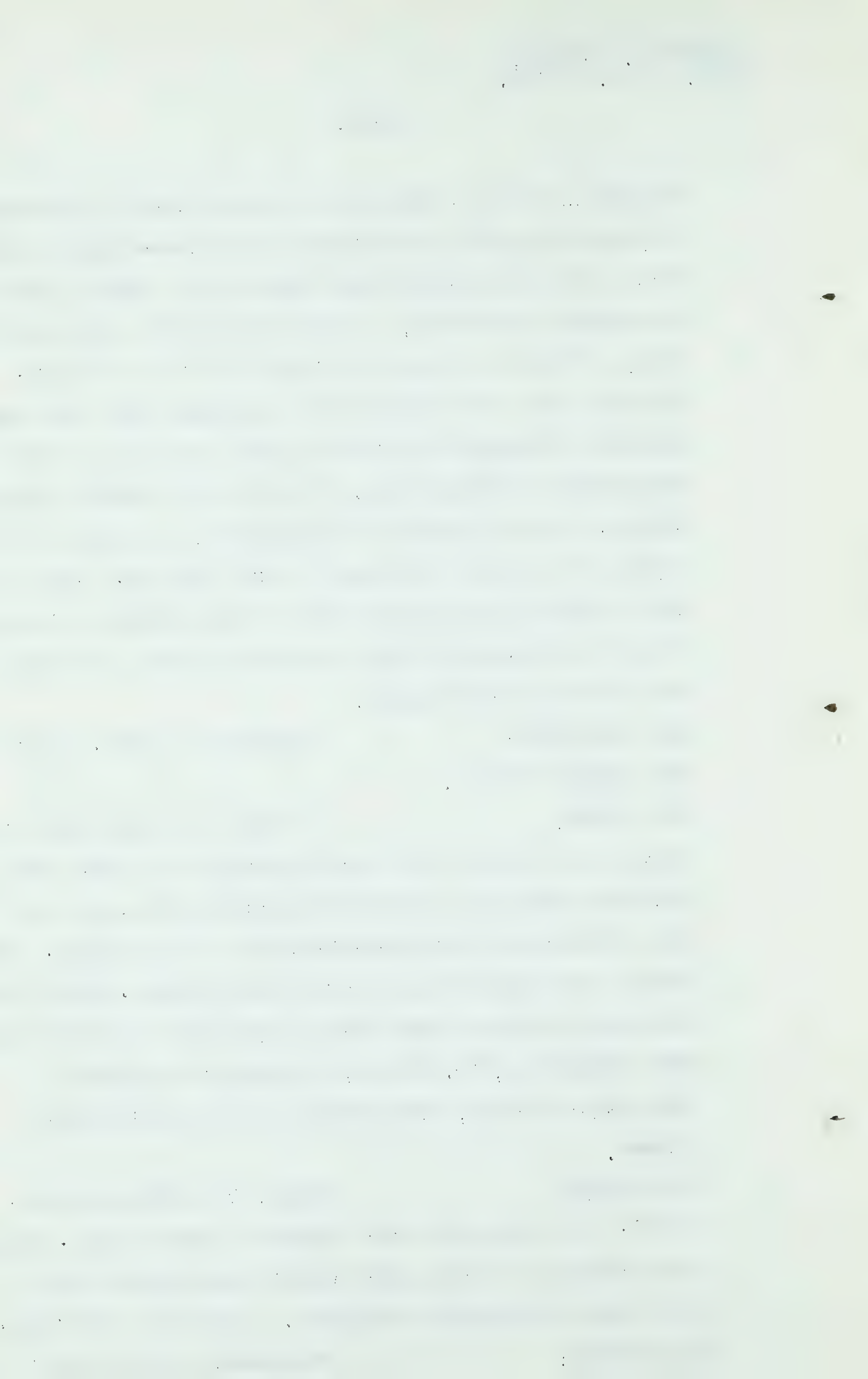
billion -- but it comes out at Pincher Creek to Diamond City and the point of junction in the Trans-Canada line which has been carrying the other and the exhibit shows substantial quantities, I think 113 million a day all the time, and that is dumped off into the line to Calgary, so that the line from Diamond City to Calgary will have an aggregate throughput of 365 plus 238 less any use that is made south of Diamond City. The line from Pakowki Lake, whether it goes directly to Diamond City or by way of Bow Island, will have a throughput of 283 billion. And if I can get these gentlemen to give us some estimate of what either the looping of those lines would cost, it seems to me we have got the figures.

MR. C.E. SMITH: It seems to me Mr. Deutch did not qualify himself.

DR. GOVIER: If one of the witnesses could explain in a little more detail just what you have outlined, because we have not had that presented so far, and also some indication of the practicability of the scheme. The Board is not suggesting that the cost per Mcf. should be calculated at three significant figures but we would like some indication, Mr. Porter, of whether the scheme is practicable or not, even though it is an illustrative scheme.

MR. PORTER: Well, it is illustrative. I don't know quite how far I should be asked to go. The contributions of other participants would seem to have been quite as extensive as these. I will do it for you.

DR. GOVIER: Presumably this is your proposal.



Everett G. Trostel,
Exam. by Dr. Govier.

- 3271 -

MR. PORTER: No, this is something I thought was entirely outside my function and was presented purely at the request of the Board.

THE CHAIRMAN: In the original request to you and to all others?

MR. PORTER: Yes.

THE CHAIRMAN: I think you will find most of the others have given evidence.

MR. PORTER: I am only talking about the extent of the study, that is all. We will give you any more help that we can. Warterfield is gone, Shattuck, I think we can hold. These two gentlemen will endeavour to give you some figures.

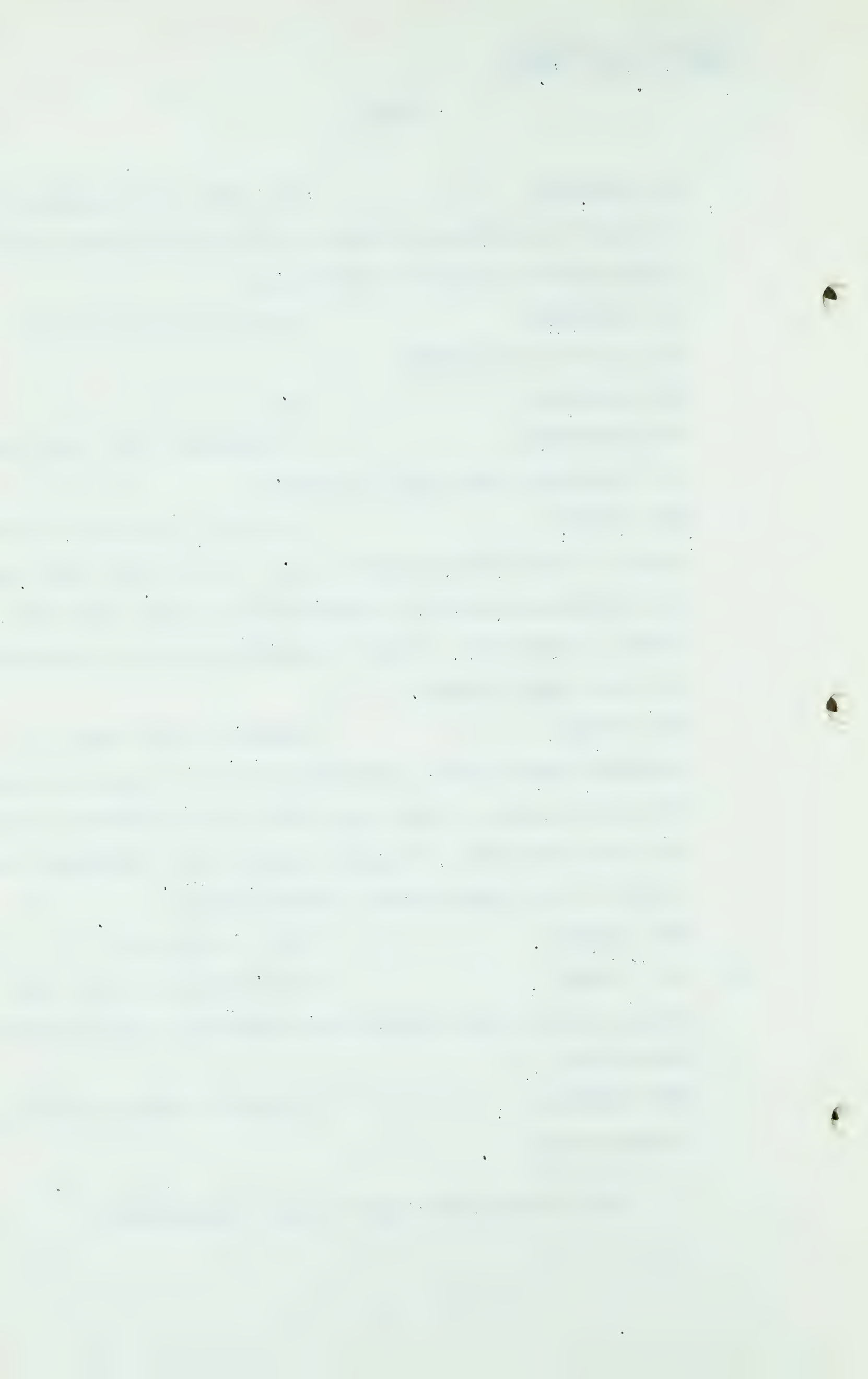
DR. GOVIER: Again, I would like to emphasize that we are not asking for any highlights and detailed studies of that but merely an indication as to its practicability. I think some of your witnesses would be able to do that without too much work.

MR. PORTER: Well, I hope so.

Q DR. GOVIER: Mr. Trostel, we have got bogged down on that subject and perhaps we could continue on another.

THE CHAIRMAN: I think we might adjourn for a few minutes.

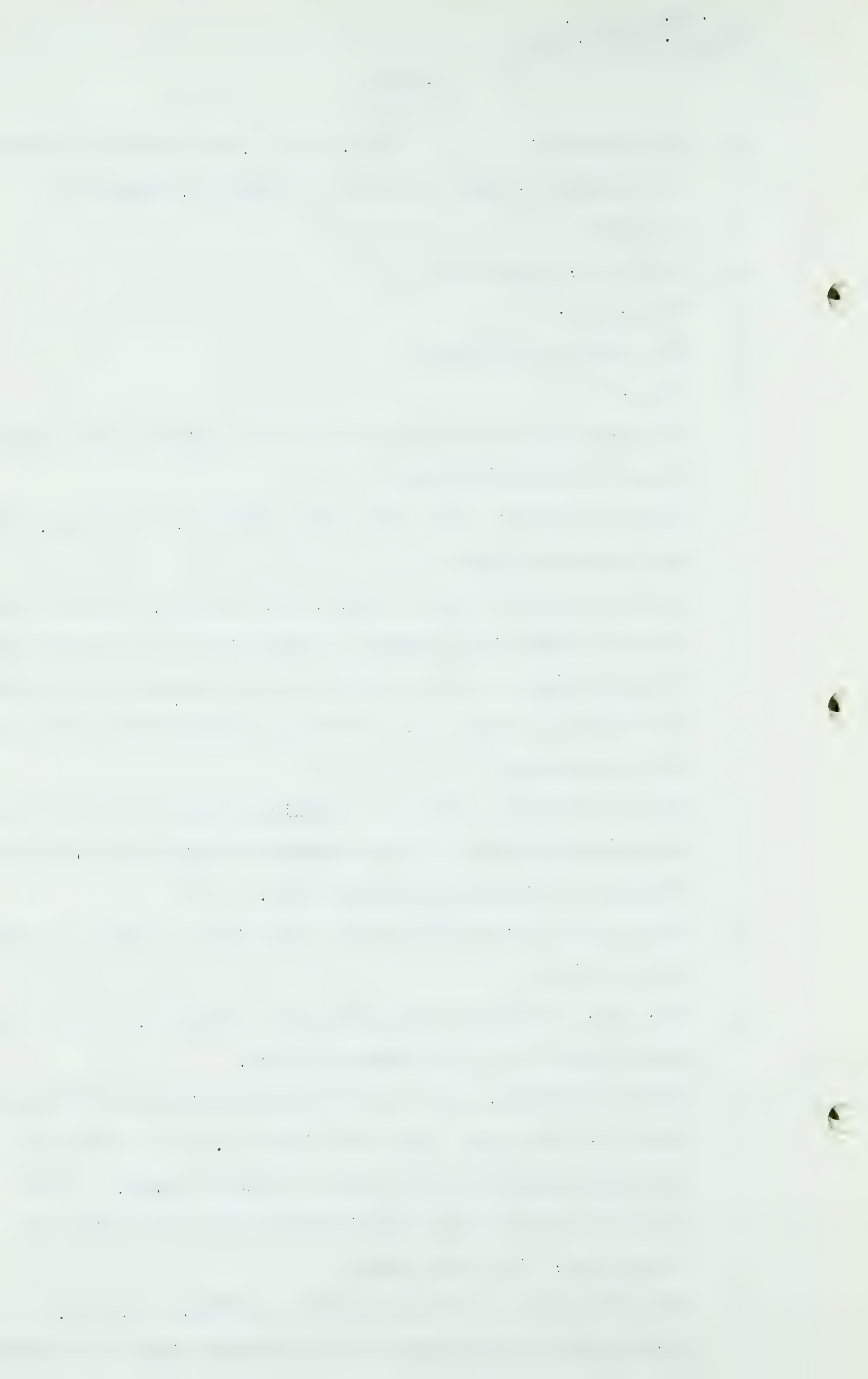
(The Hearing then took a short adjournment.)



E. G. Trostel,
Exam. by Dr. Govier

- 3272 -

- Q DR. GOVIER: Mr. Trostel, just before we leave this matter, would you look at Table I, column 17?
- A Page 1?
- Q Table I, column 17?
- A Yes, sir.
- Q The Bow Island Field?
- A Yes.
- Q I believe your note shows that those figures were taken from the Interim Report?
- A That is correct, sir, they were derived, I believe, from the Interim Report.
- Q I am not sure of this at all, Mr. Trostel, but my recollection was that the capacity of the line, the present Canadian Western line, is of the order of the maximum figure which you show in column 17. Could you confirm that for me, or do you know?
- A That 54 million figure is a maximum figure shown in the Interim Report for the top maximum peaking rate from Bow Island. I did not go beyond that.
- Q So that you are not sure how that ties in with the capacity of the line?
- A No, sir. I assumed the values in column 17, I think it is on page 49 of the Interim Report.
- Q If it should be, and your further thinking on this will find it, I am sure you will find out, if it should be that the capacity of the line is nearer 54.60, I take it then that column 17 would assume that that line is being used, is that right?
- A That that line is being used for peaking, yes, sir. I believe some indication of the capacity might come from



E. G. Trostel,
Exam. by Dr. Govier

- 3273 -

the Interim Report on page 49, wherein Foremost is 6 million, Bow Island 54 million, which makes 60 million, and Foremost during that same year is $7\frac{1}{2}$, which would make $67\frac{1}{2}$.

Q Yes. I am sure the Board has the figure for the capacity of that line, but I cannot recall it just now.

MR. C. E. SMITH: Mr. Steer, might be able to tell you that.

MR. STEER: No, I cannot. I have been trying to think of it, but I cannot.

Q DR. GOVIER: There was another matter, Mr. Trostel. I wonder if you do happen to have calculated the per cent of the marketable gas which your schedule assumed to be produced in the 30-year period?

A By each field?

Q Yes? Do you have the figures handy?

A No, sir, I would have to calculate that.

Q Well, we will save you the trouble, we will do it ourselves. Mr. Porter does not want you to do any more work than necessary.

MR. PORTER: I do not mind him doing the easy jobs.

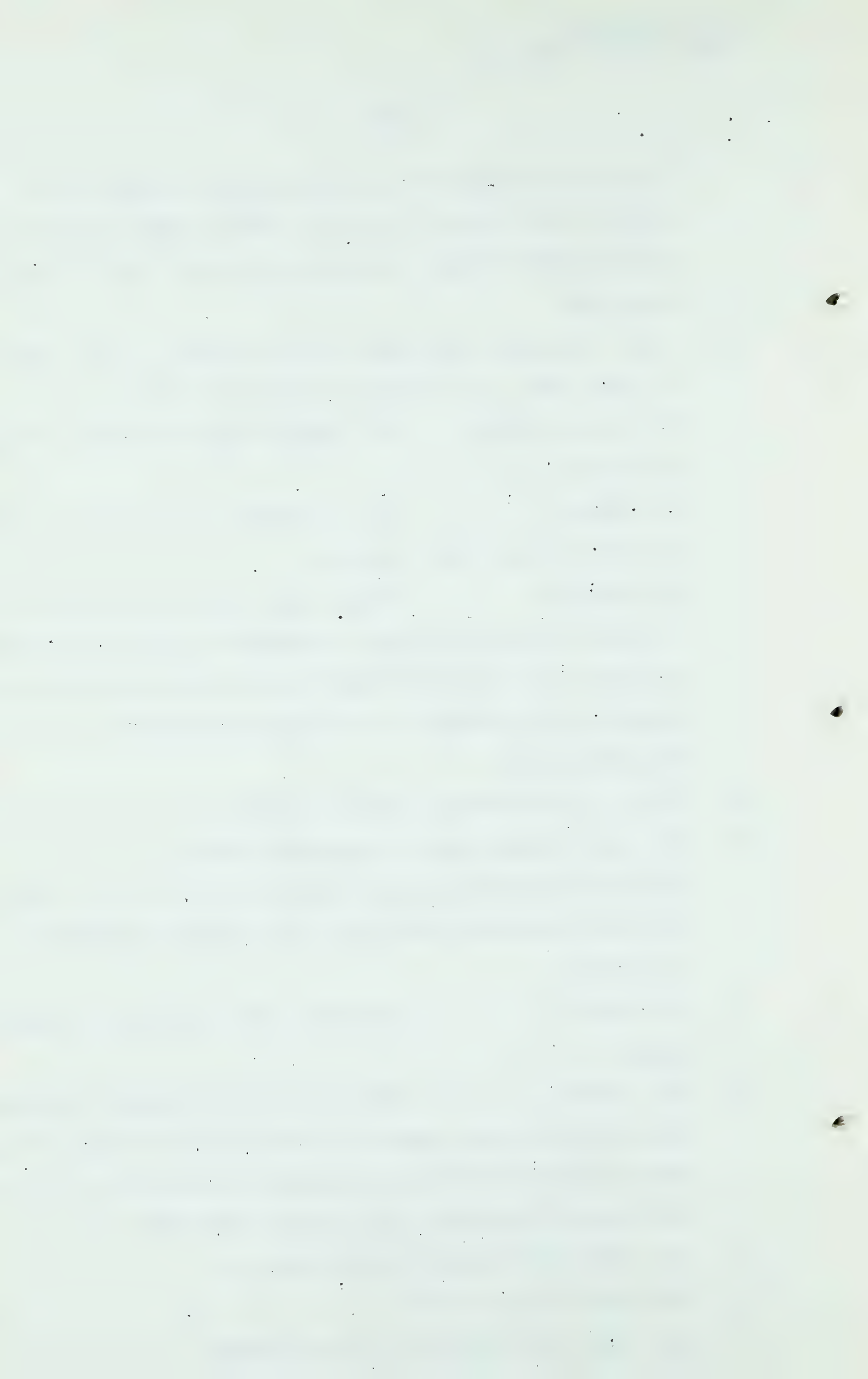
Q DR. GOVIER: Am I right, Mr. Trostel, in assuming that insofar as the number of wells in each field is concerned and their drillings schedules, that that is the same as it was in, what was it, Volumes I and II?

A Yes, and there are some in III and IV.

Q And some in III and IV?

A Yes. They run through all four volumes.

Q That has all been covered in your previous exhibits?



E. G. Trostel,
Exam. by Dr. Govier

- 3274 -

A Yes, sir, with the exception of those exhibits in which modifications were put into testimony this morning. There will be additional wells in Cessford. There will be a slight reduction in Countess.

Q And do we take the same prorating factors there?

A I was trying to copy down those figures in case somebody would ask me, this noon, and I will see if I can find them for you. That might help you.

Q Yes?

A For example, in Cessford, and these will be the wells contemplated at present in the Delhi area in the Upper Blairmore, a total of 54 wells; the Second Blairmore, 4 wells; the Viking Sand, 8 wells; the Sunburst, 40 wells. In the Sunnynook area, 17 wells in the Viking; 24 wells in the Upper Blairmore; and 12 wells in the Sunburst.

Q Are those wells or sand completions?

A They will be sand completions, Dr. Govier.

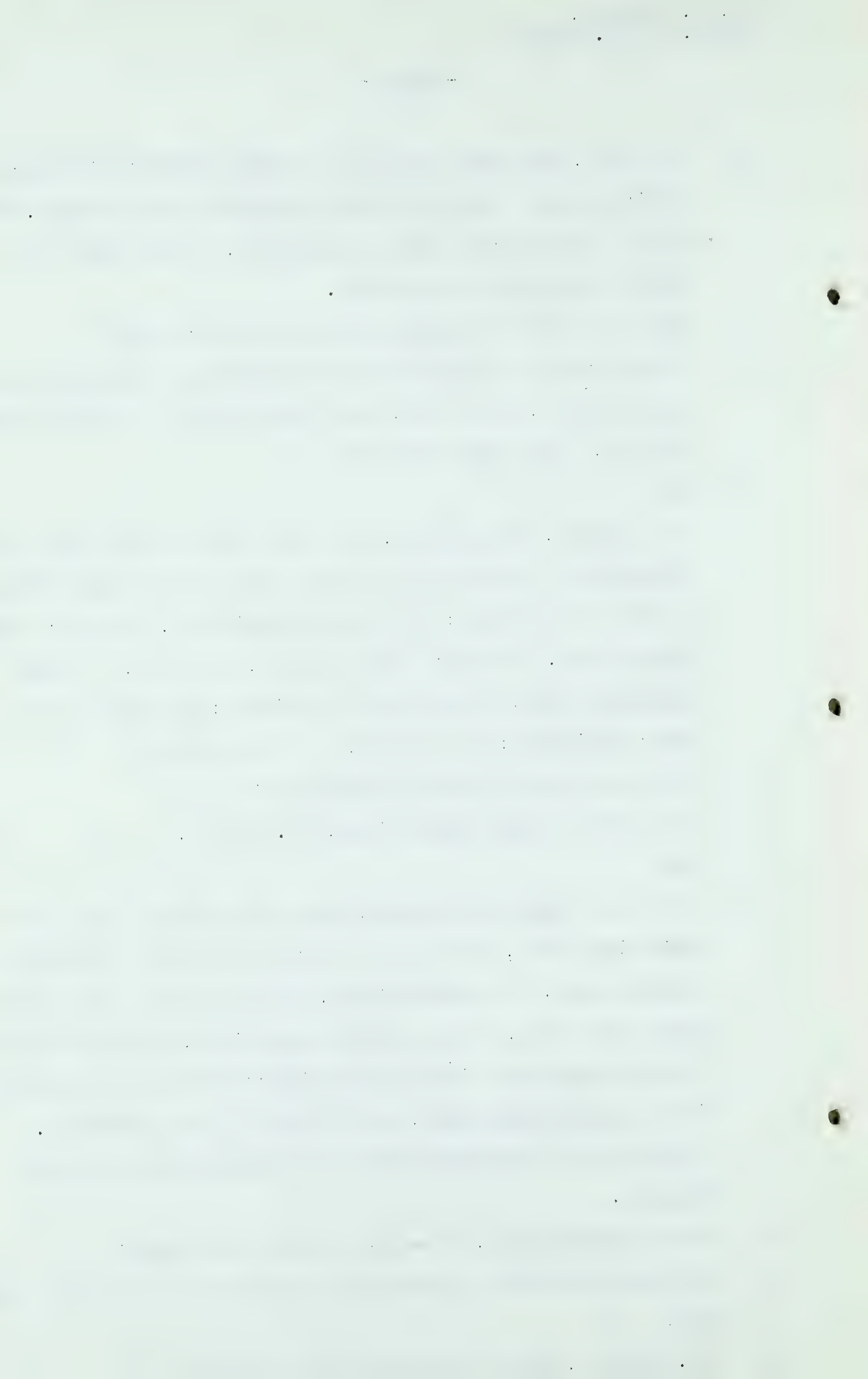
Q Yes?

A A revised figure on Countess will be 8 wells to the first Bow Island Sand, and 6 wells to the Second and Third Bow Island sands. The third field, North Tangent, and these again are wells, I mean, well completions, or sand completions, 6 sand completions in the Upper Peace River sand, 10 wells in the Upper Nikanassin, and 10 wells in the Triassic. These are the estimates that go with our current reserve figures.

Q In the other cases, it would be the same figure?

A In the other cases, it would be the same as are in the record now.

Q Mr. Trostel, would you look at the tabulation that gives the



E. G. Trostel,
Exam. by Dr. Govier

- 3275 -

detail of the Leduc field deliberability, and that is under Table IV, is it? Yes, it is.

A Yes, sir.

Q I was very interested, Mr. Trostel, in your description of the study you made of the D-2 reservoir, and I would like to be sure that I completely understand it. I jotted down a few notes as you went along, and there were one or two things that I was not clear on. As I understand it, you drew composite gas/oil ratio cumulative oil production curves for wells by groups as to year of completion, is that right?

A As part of the work.

Q As part of the work, that is what I mean?

A Yes.

Q But they were gas/oil ratio cumulative oil production curves, were they?

A No. As a matter of fact, by wells they were gas/oil ratio time curves.

Q Gas/oil ratio time curves?

A Yes, which were first averaged.

Q I see?

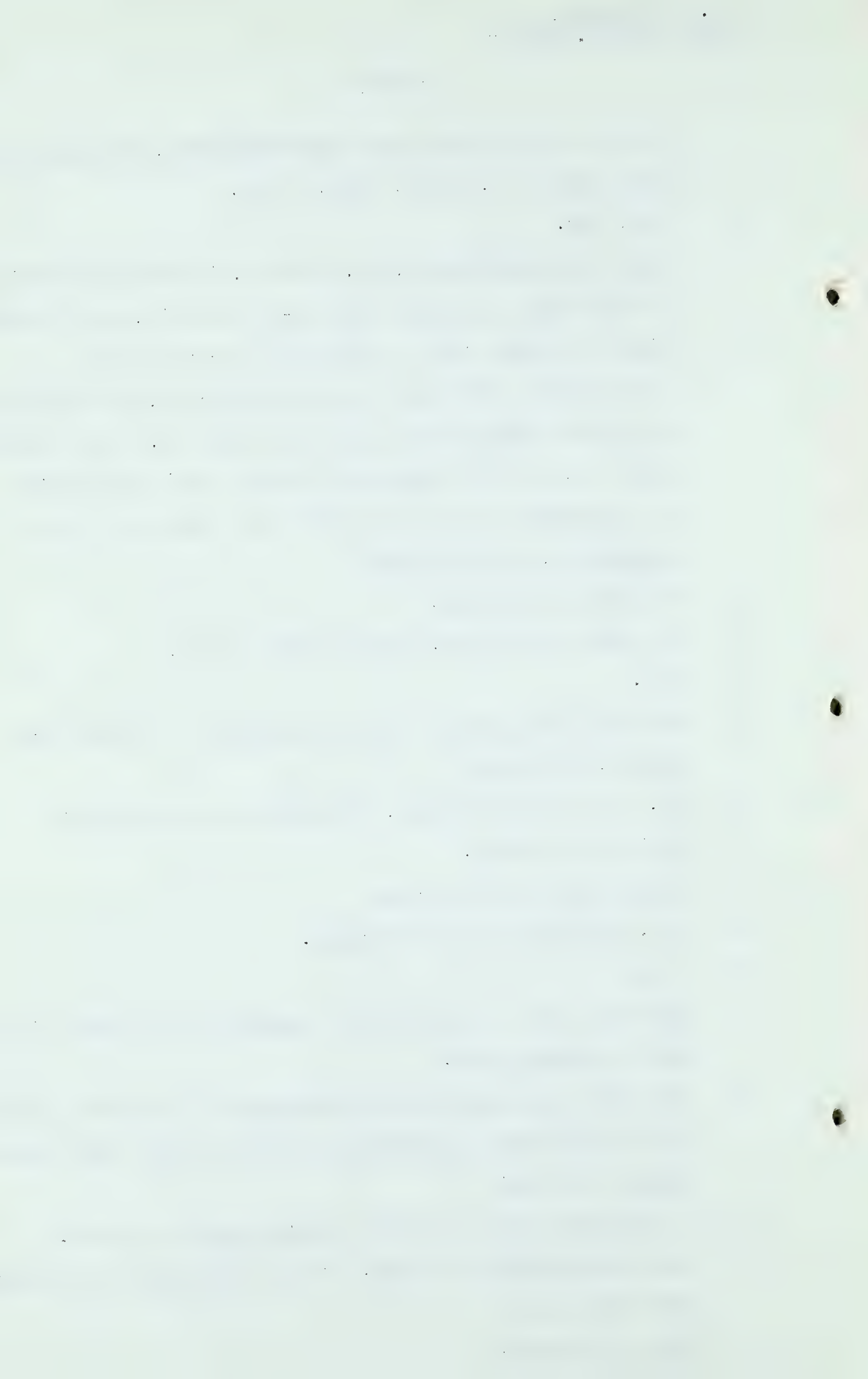
A And from those we arrived at a gas/oil ratio cumulative for an average well.

Q Was there any significant difference in the curves developed for the 1947 and the 1948 year wells, or were they substantially the same?

A I would say they are pretty substantially the same.

Q And you superimposed those, or you constructed an average from those two?

A Yes, I did that.



E. G. Trostel,
Exam. by Dr. Govier

- 3276 -

Q And was that still on a time basis?

A That was still on the time basis, yes, sir.

Q And did you convert it over to an oil basis?

A I applied them both ways, yes, sir.

Q And could you tell me, Mr. Trostel, how you extended that?

A On a gas/oil ratio basis, or on an oil basis? I extended both.

Q Perhaps if you would give me a little more detail of your procedure at that point it would help?

A Well, I established decline trends of the oil. I actually used semilog paper with respect to the time for the average well, and estimated what the gas/oil ratio history likely would be starting with the experience history to date, drawing the curve on a cut and trial basis, following the general trend, normally experienced in a depletion type of field, so that I would recover for an average well the gas fraction assigned for that well of the total pool, that is, of our total reserve.

Q I see.

A And following that a fit was made back and forth between the gas/oil ratio versus the cumulative oil production curve and the time curve until they were brought into agreement, and which appeared to give a reasonable picture.

Q Consistent with your estimate of the total producible gas?

A That is correct.

Q I see?

A Would you like me to continue?

Q I would like you to go a little further, if you would?

A Having arrived at what we thought would be an average curve of an average well, we took the performance curve for the

E. G. Trostel,
Exam. by Dr. Govier

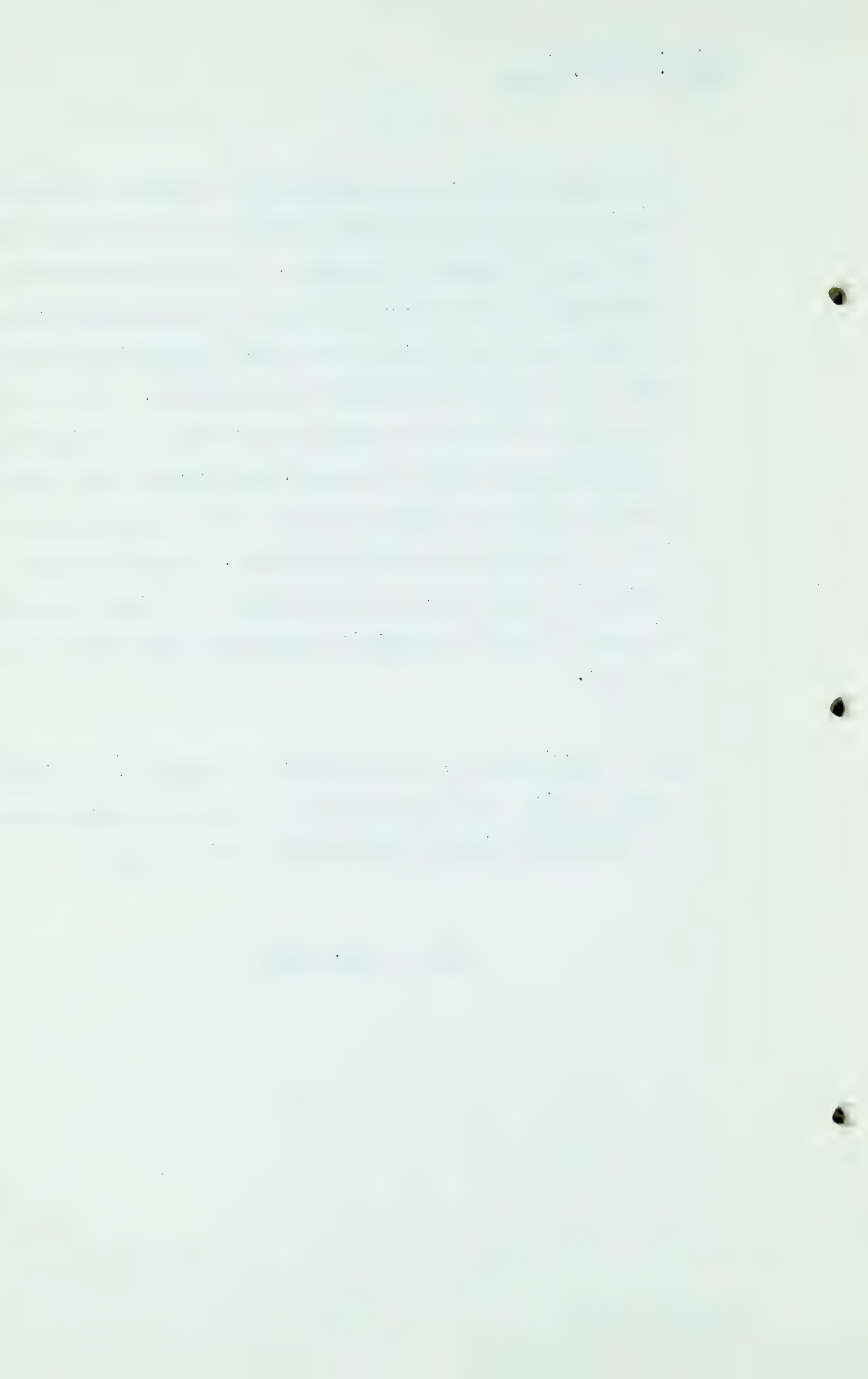
- 3277 -

field as a whole, and determined the trend of well-drilling as has been experienced during the latter part of 1950 and '51 through to August. I believe that came out approximately 150 wells per year at the drilling rate, and we first took the wells in the 1947 completions and extended them out by years throughout their period. Then we took the number of wells in 1948 and put them on a line below, staggered them there one space, and carried them across. And then from the number of wells which we assumed for each year, we built up a composite curve, staggering each year's completion over one, and then summed the final and entire picture to get the composite production for both oil and for gas.

Q I see?

A And in arriving at, or putting them together, we finally came out with our pool picture of what we thought would be producible without allocation of oil and gas.

(Go to page 3278)



E. G. Trostel,
Exam. by Dr. Govier.

- 3278 -

Q I see.

A Then as I stated this morning having plotted that curve we noted that the average gas/oil ratio of the pool as a whole was increased to 1000 approximately at the end of 1956, and at that time the pool gas production would be approximately 32-9/10ths million cubic feet of gas per day and at that time the pool would just be developed on a 40-acre spacing in conformance with the reserves and acreages shown in our previous exhibits. Now, if I may proceed, and perhaps this is repetitive . . .

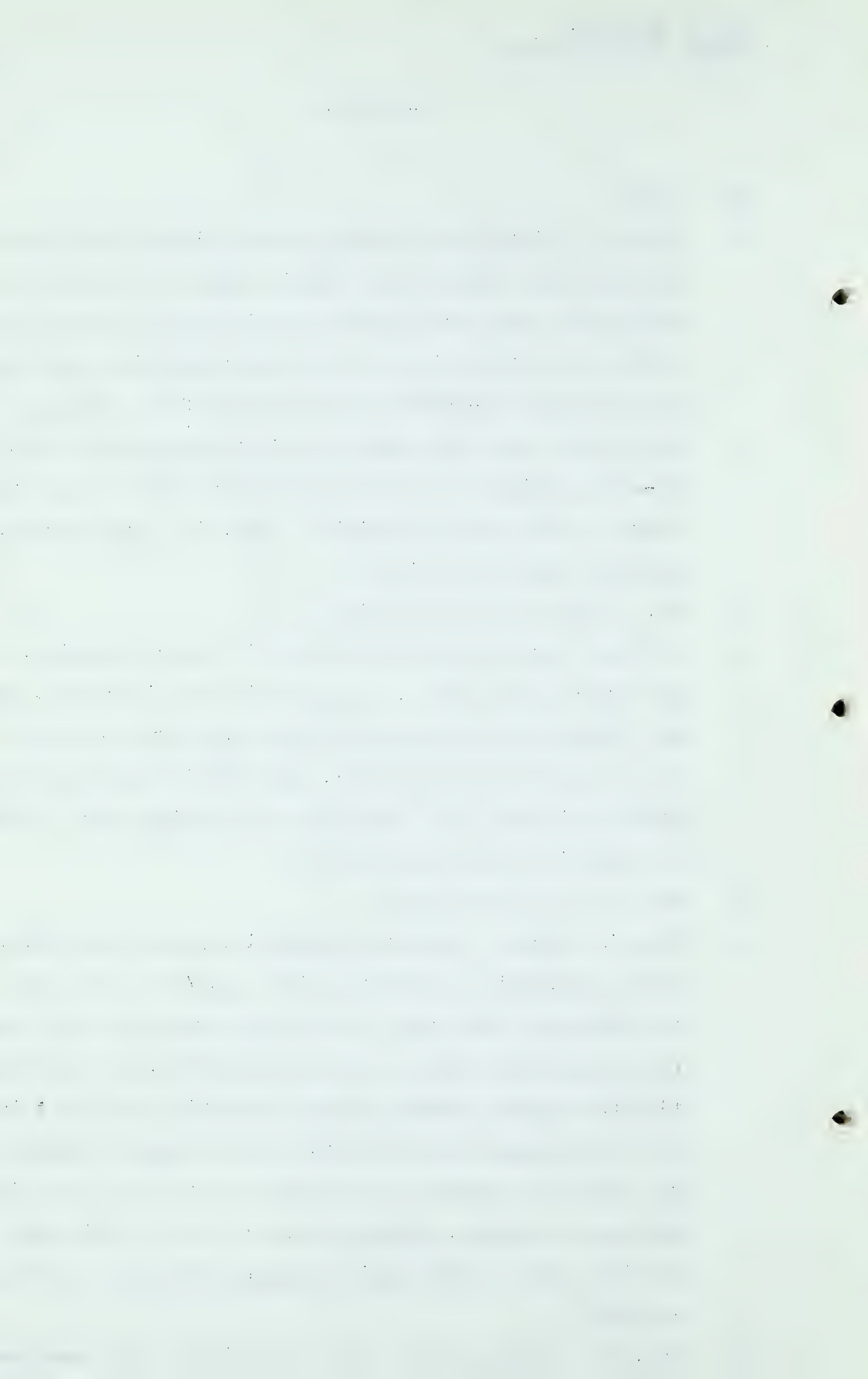
Q No, I wish you would continue.

A At that stage the gas production, if under restraint, would go higher as the ratio, the gas/oil ratio increased, and it was thought a reasonable allocation procedure at that time to put a gas top on the pool, and that is what was done starting in 1957, and over these succeeding years. That is shown in column 2 of table 4.

Q That is the 32.9 figure?

A That is correct. Then the cumulative production basis, which is the cumulative production with a gas/oil ratio and making the balance of the gas, we found that we still had a capacity to produce 32.9 million a day through 1969, but at that time the natural decline of gas production would set in to such an extent that in future years lesser volumes of gas would be produced and at that time the field was just allowed to decline, giving values of 26.1 in 1970 and 17.7 and 13.7 and so forth until eventually the gas is exhausted in 1975.

Q Now, Mr. Trostel, would you tell me if the pool performance



E. G. Trostel,
Exam. by Dr. Govier.

- 3279 -

curve which you refer to as being really the basis for this projection . . .

A Yes?

Q . . . having been estimated from the individual well studies, was that the gas/oil ratio accumulated?

A That was used to control that.

Q Can you tell me what the maximum gas/oil ratio was on that curve?

A I have been sorting through my papers. They seem to have been mixed up. If you will just give me time I will find it. Now, the individual average well curve ratio reached a maximum of approximately 7000 cubic feet per barrel, peak. When those were integrated and placed on a cumulative production basis and all the wells taken into consideration, some of them declining, the earlier wells being on a decline, the peak reached was 5,250.

Q In what year was that reached?

A This I have to the cumulative oil.

Q Can you tell me the cumulative number of barrels at which that was reached? That would be a more valuable figure.

A According to this estimate, it was about 152½ million barrels.

Q I take it that you would feel that that curve, that the gas/oil ratio cumulative curve would be more or less independent of the allocation procedure, would it?

A I think so. I think possibly without some allocation it might go higher than that. At least, I assume that that would be the characteristic trend.

Q You think it would be independent of the market demand for crude oil, that particular curve?

E. G. Trostel,
Exam. by Dr. Govier.

- 3280 -

A You mean subject to variation in rates?

Q Yes?

A Or what do you mean by that?

Q Yes?

A I think so. I believe if you shut down the field for a great number of years so that you could get an increased curve segregation, you could improve the picture.

Q Generally speaking you think with the market expectations as they are that that curve would be pretty well independent of the methods of oil production, do you, Mr. Trostel?

A Within limits, yes, sir.

Q It would not be particularly sensitive to the oil rate?

A No, sir, provided that you do not change the allocation system so that you take oil out at a preferentially higher ratio than just the pool average. That is without control whatsoever.

If wells with higher gas/oil ratios were given the same allowable as the low gas/oil ratio wells, you certainly would reduce the reservoir energy faster and you would, in my opinion, reduce the oil recovery.

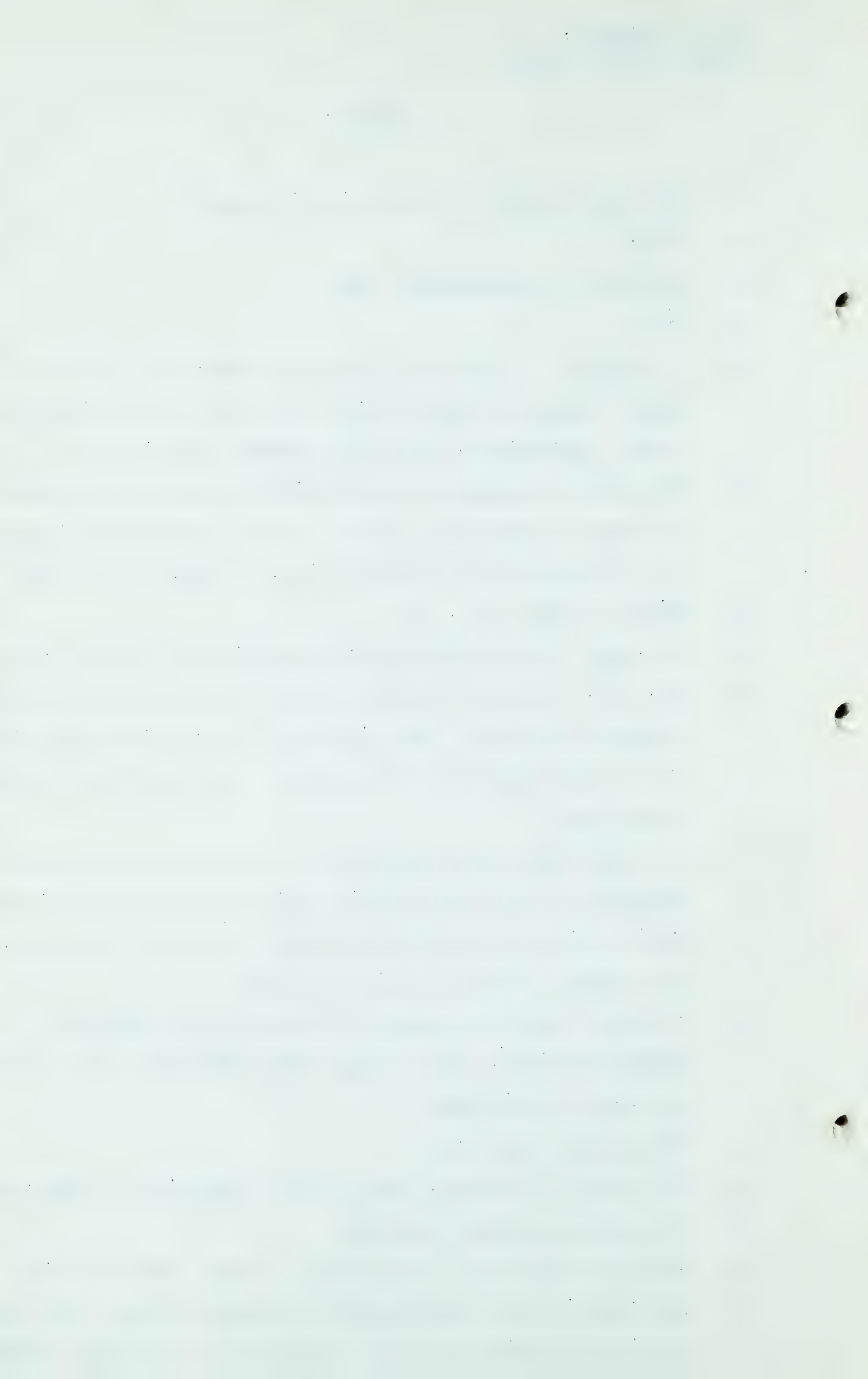
Q I take it the two important factors in the build-up of that curve are first, the average well production and secondly, the rate of drilling.

A The rate of drilling?

Q The rate of drilling, the rate of completion of new wells.

A Yes, they go right together.

Q And you relate the construction of this curve for oil, and did you take in the construction of these curves, that the rate of oil production has been regulated to the market demand



E. G. Trostel,
Exam. by Dr. Govier.

- 3281 -

over the past year?

A Yes, sir.

Q And do your curves reflect the regulation or have they been constructed in such a way as to give the decline if there had not been any regulation?

A That is what I attempted to do.

Q In other words, they represent the physical decline to the best of your ability to estimate?

A That is what I was trying to effect, yes, sir.

Q Now, the next step. Where do you assume that the -- where do you arrive at the total volume of gas necessarily involved in estimating the amount of oil to be produced at least up to 32.9 maximum, was it, Mr. Trostel?

A That is correct.

Q Can you tell me how you arrived at that estimate of the oil production from the field from now on to 1956?

A It was done on an estimated decline curve basis.

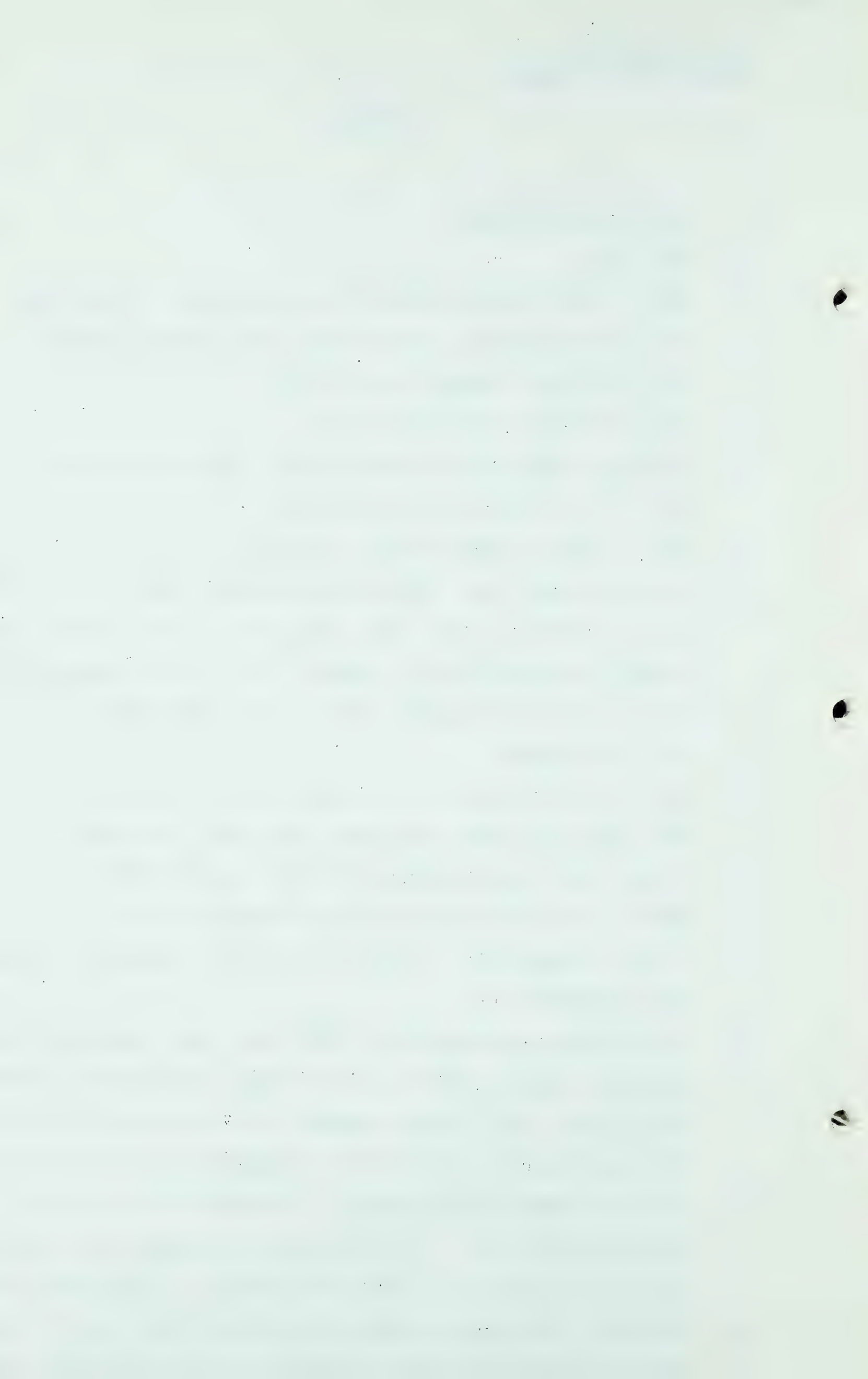
Q How do you take into account the market factor?

A I just averaged it. I did not attempt to make any variations to account for it.

Q In the years subsequent to 1956, when your suggestion is the pool might be held to a total gas production of 32.9 million per day, did you inquire into the amount of oil per well per day that would be the equivalent of those figures?

A I do not recall that figure. I believe I could arrive at that shortly, sir. It would take me probably ten minutes to calculate that. I have it in terms of cumulative oil.

Q Maybe we could make a rough calculation along these lines, Let us consider the order at which the gas/oil ratio reaches



E. G. Trostel,
Exam. by Dr. Govier.

- 3282 -

its peak?

A Yes.

Q You did not tell me the year but you gave me the cumulative oil corresponding, but in that year the pool, as I take it, would be producing 32.9 million cubic feet a day of gas at the ratio of .5250 and I think roughly that would work out to about 6000 barrels of oil from the pool, 6100 maybe?

I am not sure of the figure.

A Yes, that is right.

Q Do you know how many wells would be in the pool at that time?

A I have not estimated the drop-off at that period. I built it up to a maximum of 980 wells in 1962 with a progressive loss of wells from there on to 1971. Unfortunately, I have got some tabulations on cumulative and some tabulations on time here.

Q Perhaps we could do it this way. Could we assume there were 600 or 700 wells. Would that be of the right order of magnitude?

A No, at that time I would say it would be down in the range of about 500.

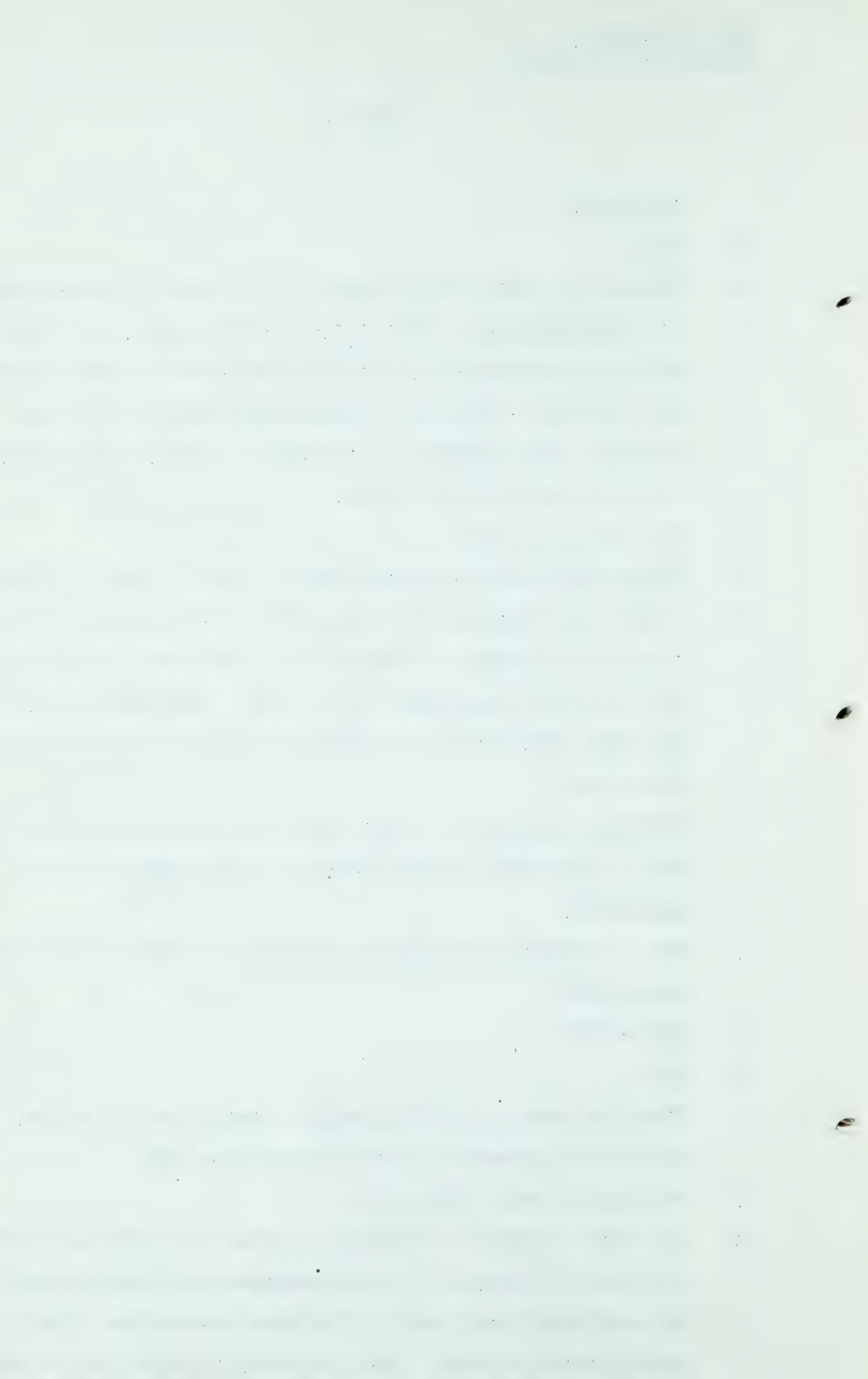
Q 500 wells?

A Yes.

Q Then that would be 6000 barrels, divided by 500 wells, which would be 12 barrels of oil per well per day?

A It would be well down, yes.

Q And this is what is bothering me, that the proposal that the pool be regulated on the maximum gas feature might not be consistent with good oil recovery economics. What is your opinion on that? What is more, it might not be consistent



E. G. Trostel,
Exam. by Dr. Govier.

- 3283 -

with the share in the market of those oil wells.

A Well, at the time that that gas/oil ratio peak is reached, we are practically at the end of the productive life of the D-2 and I think that that will be very close to the capacity of the wells at that time.

Q I see.

A In other words, we have reached the decline period when that goes out of effect. Now, if I could find that chart again, when that gas/oil ratio peak is reached of $152\frac{1}{2}$ million, which is out of an ultimate of 159 million . . .

Q I see.

A . . . so we are close to the end.

Q Can you give me two or three points on the gas/oil ratio cumulative curve?

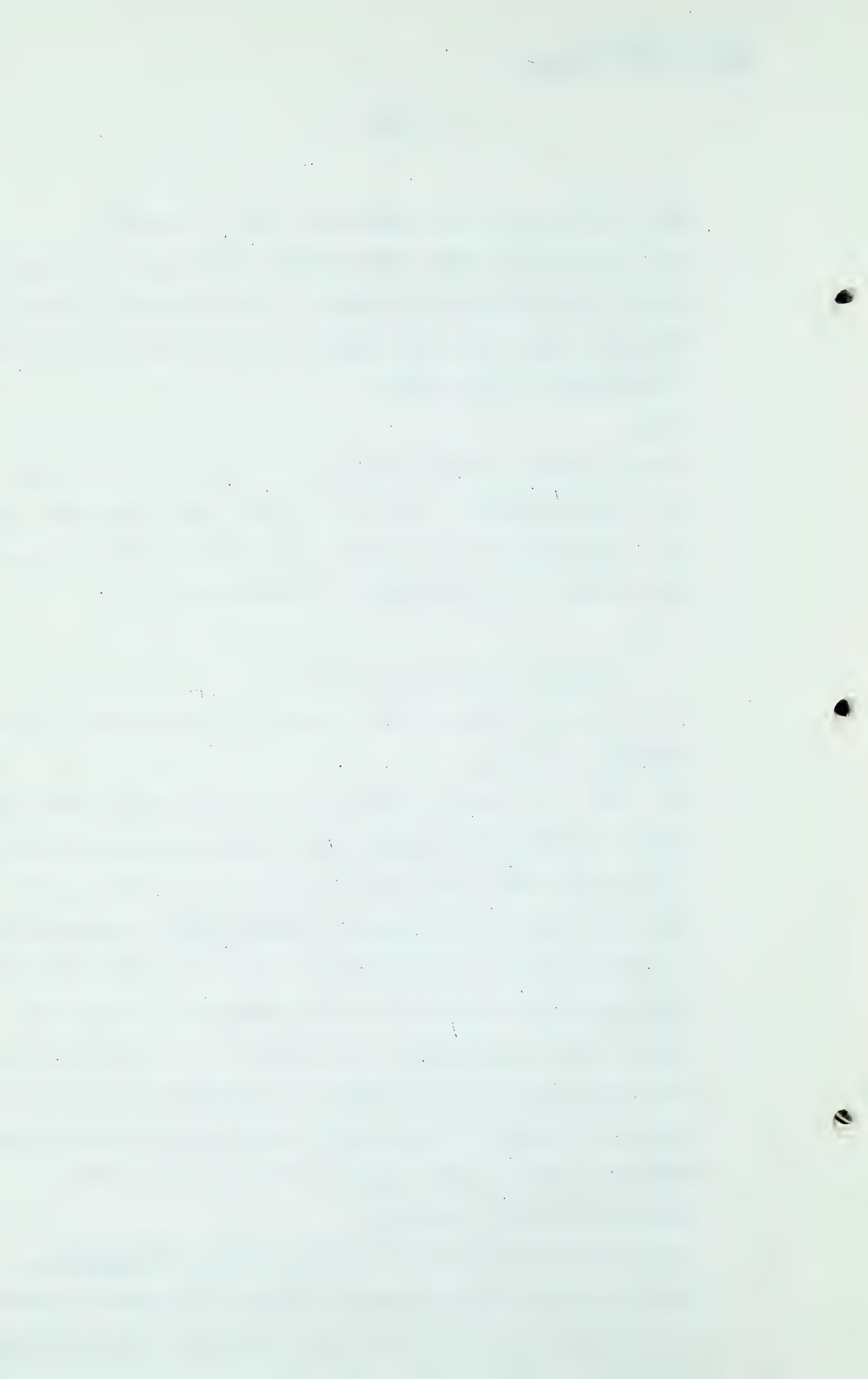
A Yes, sir. It starts in around 500 or 550 cubic feet per barrel at 5 million barrels, and increases fairly linearly to about 780 cubic feet per barrel at 62.5 million. It is estimated that the 1000 gas/oil ratio would be reached at 85 million barrels cumulative and the curve will then start increasing more rapidly with the cumulative production. For example, with a cumulative production of 120 million barrels the average gas/oil ratio will be 2,300 and at 140 million barrels the gas/oil ratio will be 3800, and at 150 million barrels it will be very close to the peak of 5,200.

Q That is fine, Mr. Trostel.

A And then it declines very rapidly to the 159 ultimate.

Q Then the average gas/oil ratio in the field would be about 100 when half of the oil has been recovered, is that right?

A That is right, provided that we are speaking on the average and these wells are developed on the staggered program, yes.



Everett G. Trostel,
Exam. by Dr. Govier.

- 3284 -

Q Well, then, as far as you know the figures given in column 2 for the D-2 gas production would be consistent with the economical recovery of oil, would they, Mr. Trostel?

A We attempted to make them that way, yes, sir.

Q I take it they might require some modification in the line of the changing market demands or the changing allocation of oil to that pool?

A That certainly would have to be taken into consideration. As a matter of fact, as I said, we built a potential curve, if you like, per well, a straight line and semi-well. If the total outlet was reduced before that, then it would extend the line.

Q I think Mr. McKinnon asked you this morning about need for processing the Lower Cretaceous gas, Mr. Trostel?

A Yes, sir.

Q Do you have any gas analyses?

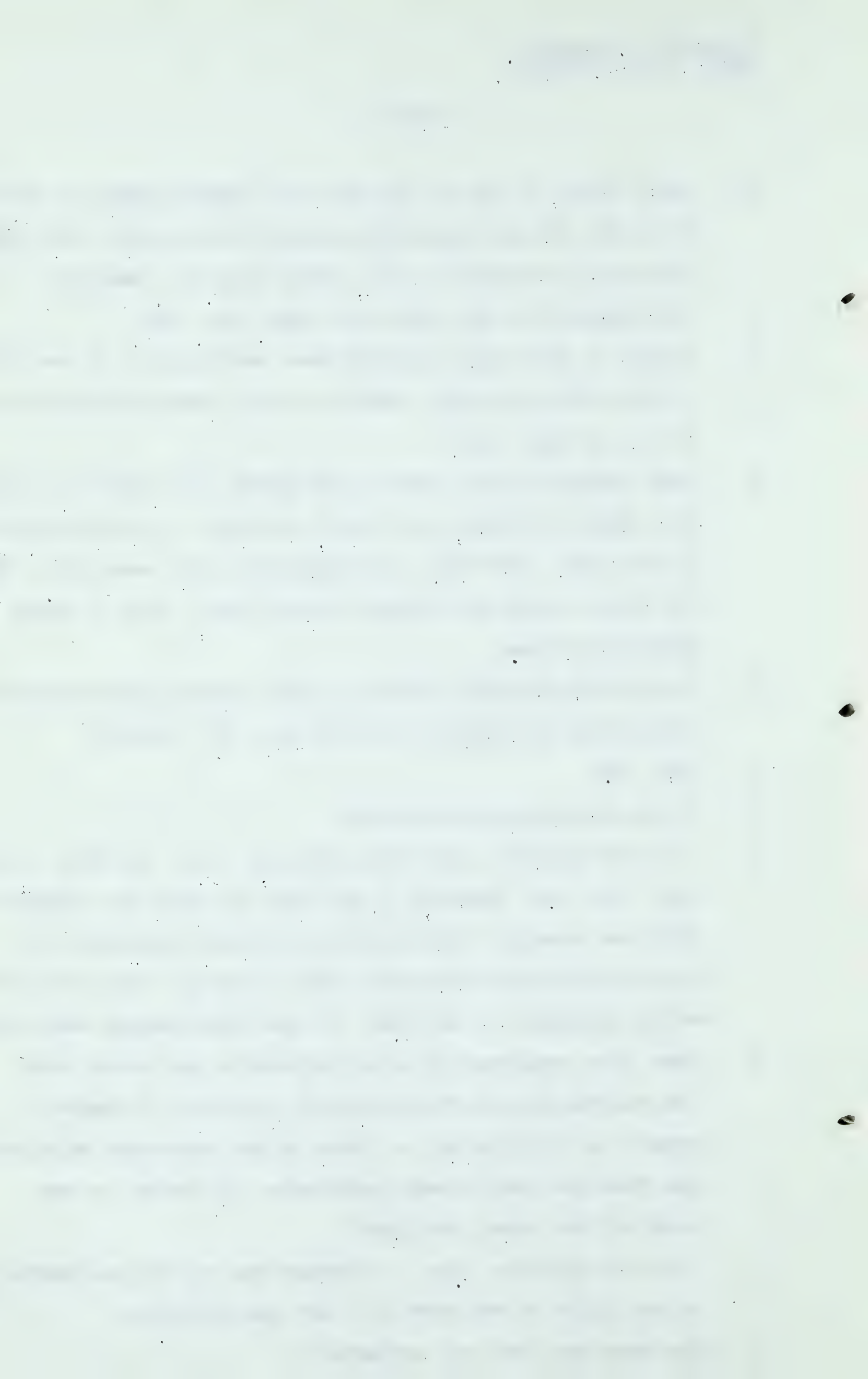
A I do not believe I have them with me, sir. In fact, I am sure I do not. However, I can tell you that the analyses which we obtained indicated very similar properties in richness for the Cretaceous sand as the gas cap in the D-3 and the analysis of the D-2. It was surprisingly similar.

Q Were those analyses of Lower Cretaceous gas taken about the central part of the field, do you know, or maybe I should ask it this way, - they do not represent solution gas from the small Lower Cretaceous oil fields to the north of the river, do they?

A I do not think so, sir. I thought the way it was marked in our files it was sort of a dry gas analysis.

Q The same gas that you estimated?

A I thought so.



Everett G. Trostel,
Exam. by Dr. Govier.

- 3285 -

Q Another thing, Mr. Trostel, and that is in connection with the size of the plant.

A Yes, sir.

Q I was rather concerned with the proposed expansion of the plant from 70 million per day up to 100 million per day at a time when the life of the equipment or the future life of the equipment was only ten years, and that the further extension from 10 million to 110 with a future life of only five years, is that reasonable?

A That is not the total future life, that is merely the end of the 30-year period. For example, in the 30-year period we only produced 61.7 per cent of the Lower Cretaceous reserve, about 67 per cent of the D-3 pool gas cap reserve, so that there are some 165 billion cubic feet still available after the end of 30 years.

Q Is that enough, in your opinion, to justify these expenditures?

A I would think so. That would surely run another five years. In fact, it would be about equivalent to run the 110 million for something over four years if it could be taken out that way. However, if you look at the picture in 1970 for the additional to go from 70 to 100 million feet, the plant would have a life of at least fourteen years at that rate, and for a plant of that size in the area quite likely other gas may be found that may be channelled to that plant.

Q You are quite satisfied, are you, Mr. Trostel, that the extension of the plant along the line you have indicated is a reasonable and economical program? I think you have explained that the Trans-Canada proposal would certainly

Everett G. Trostel,
Exam. by Dr. Govier.
Exam. by The Chairman.

- 3286 -

offer a market for all excess summer gas. Have you considered the sale of the liquid gas and the market for that?

A Yes, I have considered it. I do not have an exactly dependable picture. However, it always seems to me, for example, that butane, which seems to be in excess, could be put into the oil pipeline. I understand that there is going to be a chemical plant, the celanese plant, go into the area. I do not know, but I presume butane would be a pretty good starting point for them for their chemical business.

Q Have you had experience elsewhere, Mr. Trostel, which indicates a gas of about the same G.P.M. as the Leduc gas could be economically processed?

A Yes, sir.

Q And all your experience would indicate that this is a favourable process?

A Yes, sir, that is correct.

Q Thank you.

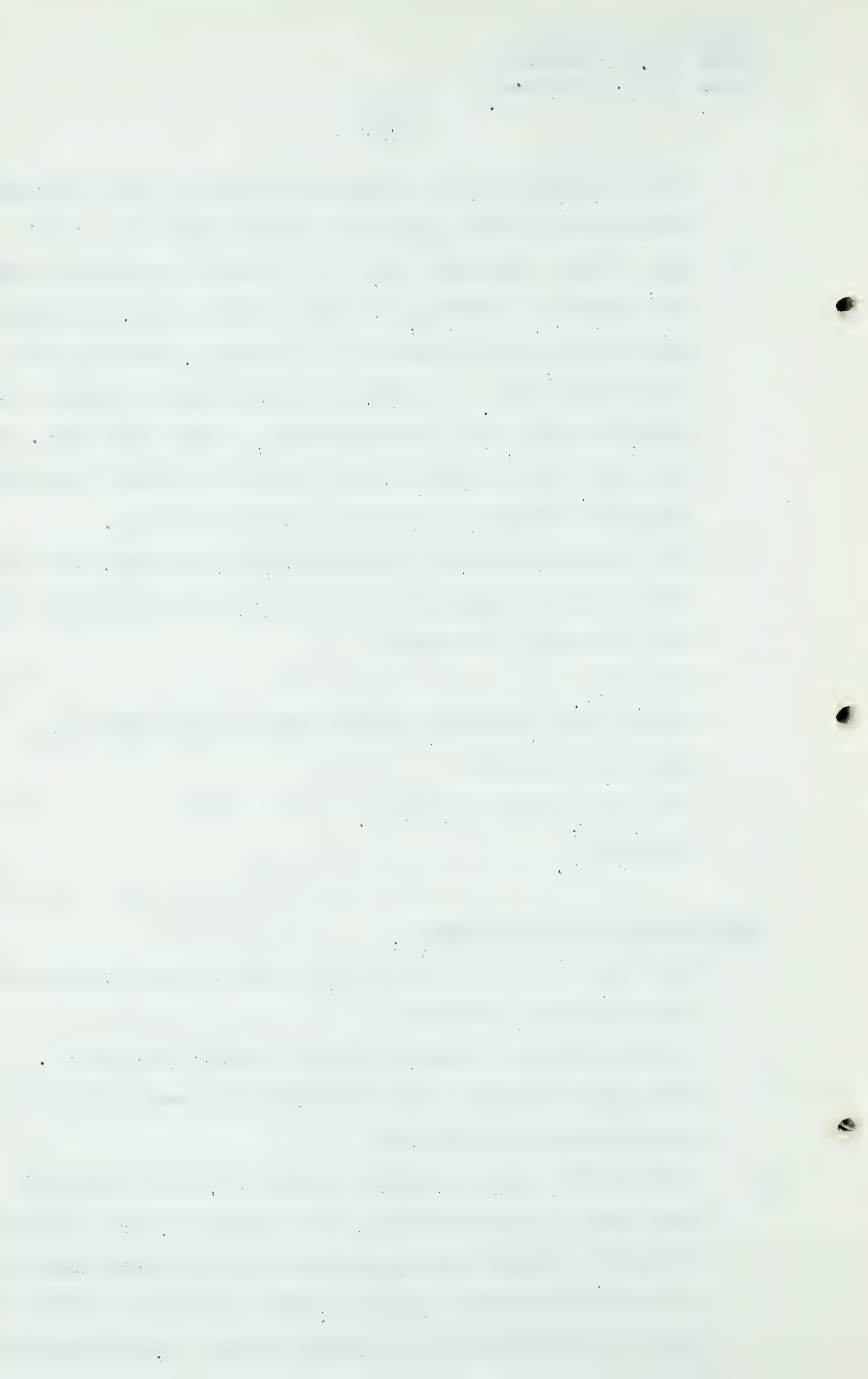
EXAMINATION BY THE CHAIRMAN:

Q What would you base that on, the price of gas? What would you base that opinion on?

A I was thinking in terms of liquids rather than gas.

Q What would the sale price of residue gas have to be to be an economical proposition?

A I have never run it through that way. I do not want to seem like I am hedging but I have talked, for that information, to a chemical engineering concern that happened to be familiar with that plant, who have had quite a wide range of experience in the United States, and they advised me that in their opinion there is no doubt about the over-



Everett G. Trostel,
Exam. by The Chairman.
Exam. by Dr. Govier.

- 3287 -

all economics of the plant in accordance with a design which they thought feasible and suitable.

Q Would the re-sale price of gas have quite a bit to do with the economics of the plant?

A Of course, it all depends how much the plant gets out of the gas.

Q Are you talking about the product realization?

A About whether or not -- what fraction of the value of the residual gas the plant takes for the processing.

Q For the extraction of the product?

A And the gas as well. It is a quite common practice in some plants for the plant to give 40 per cent of the gas as part of its fee for operations.

Q And you think the plant retaining about 40 per cent it would be an economical operation?

A Plus the hydrocarbons.

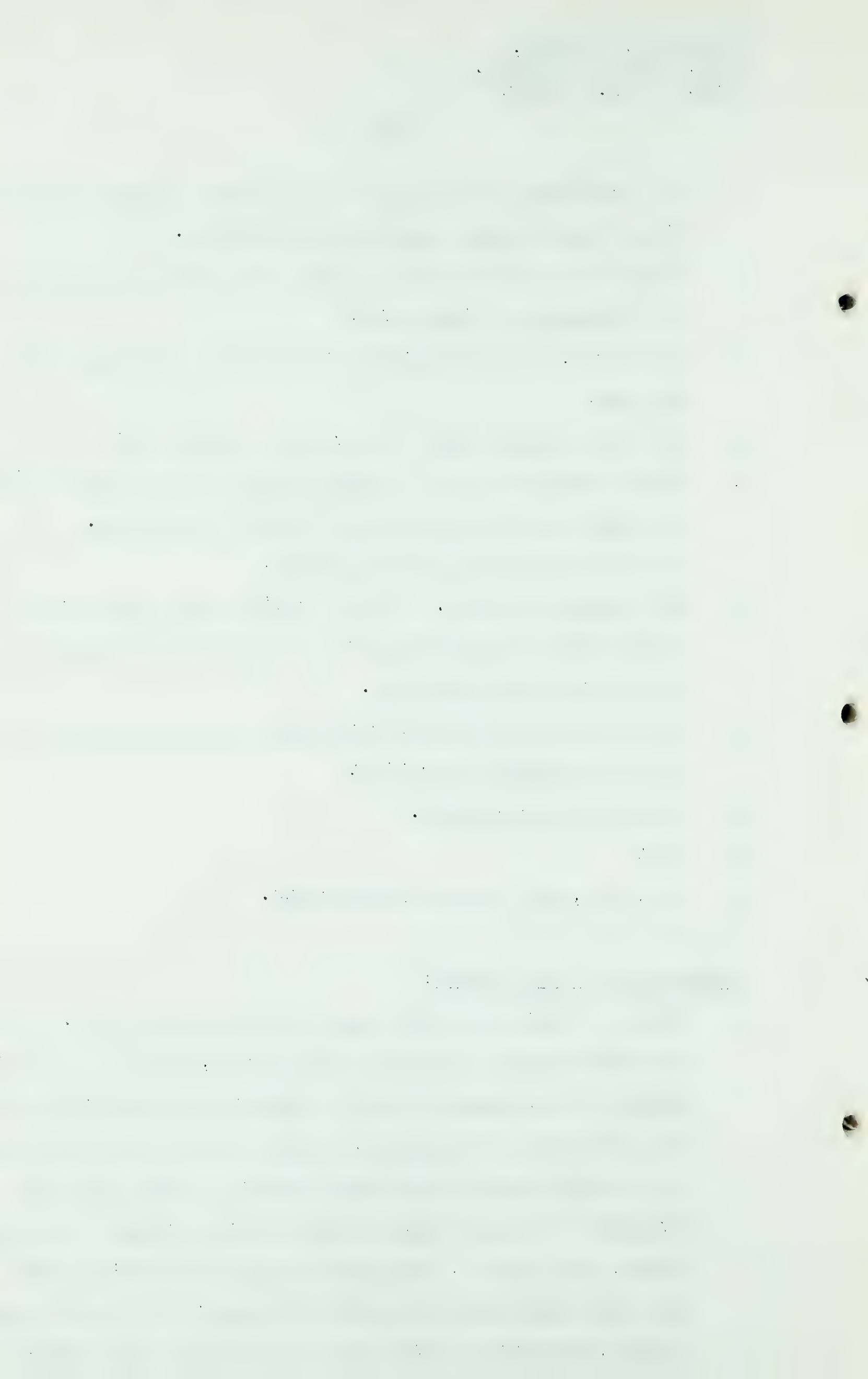
Q Yes?

A Yes, sir, the liquid hydrocarbons.

EXAMINATION BY DR. GOVIER:

Q There is just one other thing I wanted to ask you. I am not sure whether you want to answer it, but do you know whether Trans-Canada would be prepared to gather all of the gas that your schedules indicate has to be supplied to Canadian Western and Northwestern and make that gas available to those firms at their load centres? In other words, as I see it, your present proposal assumes that you will move the Pincher Creek gas part way to the load centre, that they would carry it the rest of the way?

A Yes, sir.



Everett G. Trostel,
Exam. by Dr. Govier.
Exam. by The Chairman.

- 3288 -

Q That they would carry the Pakowki Lake gas all the way to their load centre, is that right?

A Well, do you mean by "load centre" Calgary for the southern system?

Q Yes.

A Well, in the case of Pincher Creek the proposal was to carry the gas to the intersection of the Trans-Canada system with the existing utility company's system, yes.

Q Now, do you know whether Trans-Canada would wish to go further and deliver that gas right to the load centre?

A I do not believe I do, sir. That question has never come up as a matter of policy in my discussions with the client.

EXAMINATION BY THE CHAIRMAN:

Q Mr. Trostel, in regard to the operation of the Leduc plant for the years 1951-52 and 1953 --

A Yes, sir.

Q Had you discussed the operation with the operators of the plant at all?

A No, sir, I have not.

Q My opinion is that in 1952 there will be an additional compressor installed which will bring the capacity up to 24 million a day, give you up to 24 million feet of residue gas.

A That is fine.

Q I am also informed that you could not expect to have a 25 per cent overload. You gave the opinion this morning that to equal peak demands, the compression plant could be utilized for 25 per cent over its rated capacity?

A Well, that is a broad plan. I am awfully surprised if it

Everett G. Trostel,
Exam. by The Chairman.

- 3289 -

would not run at 25 per cent overload.

Q Wouldn't it depend on the compressor horsepower?

A Yes, sir.

Q You would think that with the compressors that they have now that these compressors would compress 80 million a day and that they should go 25 per cent over?

A I would think a normal installation would process -- say a plant of 16 million a day would have sufficient capacity to handle 25 per cent in addition. That has been my experience in our work in the United States.

Q But you did not make any allowance for the daily average?

A No, sir. These figures were based just on the over-all daily average. In other words, they would be down some and up some to make that average up, yes.

Q Thanks, Mr. Trostel.

MR. PORTER:

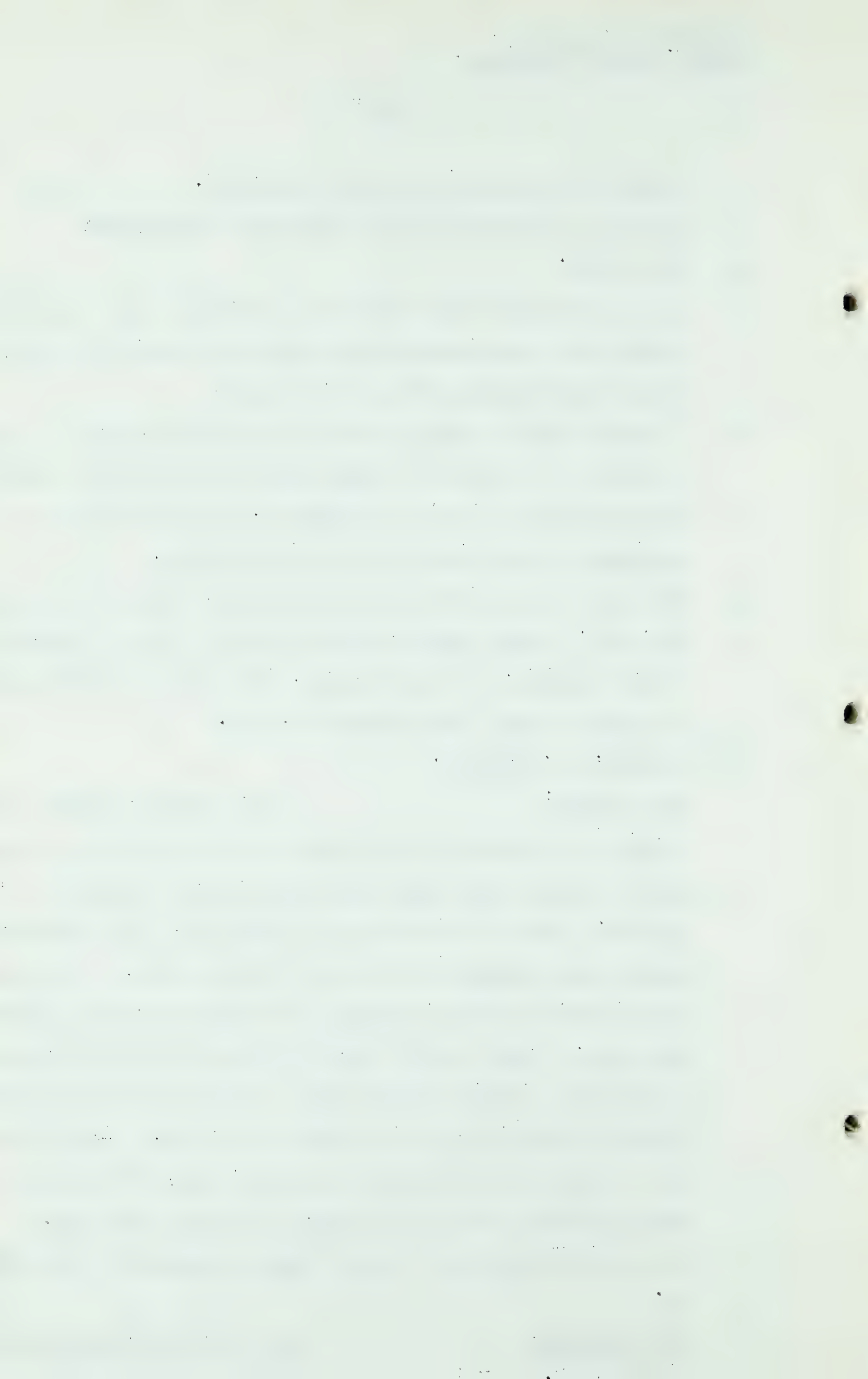
I have another witness here.

There is a witness in the hotel who just got off an aeroplane but he deals only with the financial aspects of the matter. He was on the stand in Edmonton. He said then what every financial witness so far has said, if the market is so-and-so and your figures are right we could finance the line. That is all I have to add to what is here and I have the gravest doubts about the need of calling him because technically he has said it already. All he can do is say in December what he said in May, "If we had some ham we could have ham and eggs, if we had some eggs." I do not know whether we need take up anybody's time with it.

THE CHAIRMAN:

Can you get through in 25

minutes, Mr. Milvain?



W. C. Whittaker,
Dir. Ex. by Mr. Milvain.

- 3290 -

MR. MILVAIN: I think I could, sir, if my
learned friends do not cross-examine too long.

THE CHAIRMAN: All right, then.

MR. S.B. SMITH: Dr. Govier was asking about
the transmission line. I have the document distributed by
Mr. Brownie a year ago which perhaps could give you the
information. It was distributed by Mr. Brownie on October
11th, 1950.

DR. GOVIER: Was it in these proceedings,
Mr. Smith?

MR. S.B. SMITH: Yes, but I have not it marked
as ever having been filed. Apparently it was given in reply
to Mr. Nolan's request of September 30th, 1950. It was sent
with Mr. Brownie's letter.

DR. GOVIER: I might look at it after the
adjournment and locate it in our own files.

MR. MILVAIN: Mr. Chairman, I will call
Mr. W.C. Whittaker, who is the secretary of the Western
Coal Federation of Canada. Perhaps I should formally
mark the submission.

SUBMISSION OF WESTERN COAL
FEDERATION OF CANADA PUT
IN AND MARKED EXHIBIT 119.

W. C. WHITTAKER, having
been first duly sworn, examined by Mr. Milvain, testified as
follows:

Q In the first place, Mr. Whittaker, you might tell the
Board a little bit about yourself?

THE CHAIRMAN: I do not think it is necessary.

MR. MILVAIN: Thank you very much.

W. C. Whittaker,
Dir. Ex. by Mr. Milvain.

- 3291 -

Q You are the Secretary of the Western Coal Federation of Canada?

A Yes, sir.

Q And that Federation is made up of what?

A The Bituminous Operators, the Domestic Operators, and the U.M.W.A.

Q And you, by the way, are also the Secretary of the Bituminous Operators Association?

A Yes.

MR. MILVAIN:

Now, I think, Mr. Chairman, in view of the fact that this brief has been distributed that instead of having Mr. Whittaker read the whole of it I will have him read the first two and a half pages and the last page and a half. What intervenes in the middle is a lot of factual information which I think appears sufficiently from the reading.

Q Now, Mr. Whittaker, if you will read the submission from its commencement down to the middle of page 3.

A To the Chairman and Members,
The Alberta Petroleum and Natural Gas
Conservation Board.

Gentlemen:

The coal industry is convinced that the Province of Alberta is on the threshold of a great industrial expansion, which will furnish wide opportunities to all types of industry in the Province to grow and prosper. The coal industry will certainly find its place in any such expansion, and is sure that the presence of an abundant supply of cheap natural gas will be an important and essential factor to such growth and development. We

W. C. Whittaker,
Dir. Ex. by Mr. Milvain.

- 3292 -

are concerned therefore that the utmost care be exercised in allowing the export of gas from our Province, in order that we and other industries can be sure that the gas will be available here when and as it is needed.

The coal industry is also convinced that it plays an important part in the economic structure of this country and that care should also be taken that no unnecessary harm be done to it as an existing industry in the development of a prospective one.

There are therefore two economic views to be considered. One is to be sure that gas is retained to serve our economic and industrial expansion, and the other is to be sure that too great an economic cost be not paid through disruption of an existing industry.

Gas Reserves

A great deal of evidence has been submitted by the various applicants bearing on the question of reserves and deliverability. The coal industry deeply regrets that it did not enter into this hearing at an earlier date, and feels that a serious mistake was made in delaying its entry in these proceedings. As in every controversial issue, there are two sides to the case. We feel that only one side of the question has been dealt with by the applicants in bringing evidence with regard to reserves.

I might say, Mr. Chairman, we are not casting any aspersions on the Board itself or Utilities, but we did feel that the preponderance of evidence has been by the applicants and naturally they would put their best foot forward.

W. C. Whittaker,
Dir. Ex. by Mr. Milvain.

- 3293 -

This being so, we feel that extreme caution must be maintained in arriving at any conclusion as to reserves. In this connection we would draw to the Board's attention the material in Table I hereof -- compiled from information already before the Board.

(Go to page 3294)

W. C. Whittaker,
Dir. Ex. by Mr. Milvain

- 3294 -

From the material in the table the following conclusions may be drawn:

- (1) By taking the Board's figure as to reserves as set out in its interim report and adding thereto the new discoveries in new or old fields since the report, we arrive at the following figures:
 - (a) If the amount added for new discoveries be taken as the lowest figure given by either Dr. Nauss or Mr. Dougherty the total recoverable gas including the Board's figures as given in its interim report, is 5.58 trillion cubic feet.
 - (b) If the average between Dr. Nauss and Mr. Dougherty be taken rather than the lowest figure we arrive at a total of 5.74 trillion cubic feet.
- (2) The Board in its interim report finds that 4.5 trillion cubic feet is the required reserve necessary to maintain the deliverability of our Provincial needs.
- (3) On a conservative basis by taking the lowest estimates as above set out, there would be a mere 1 trillion cubic feet in excess of essential reserves or if the average between Dr. Nauss and Mr. Dougherty be taken we have about 1.25 trillion cubic feet in excess of such essential reserve.
- (4) It is felt that the Board's estimated requirement of 4.5 trillion cubic feet may be conservative. In observing Table 4 of the Interim Report it is noted that the requirement of the Canadian Western Natural Gas

W. C. Whittaker,
Dir. Ex. by Mr. Milvain

- 3295 -

system is placed at 1.239 trillion cubic feet and that of Northwest Utilities Limited at 1.553 trillion cubic feet. When it is remembered that one large industry now attached to Canadian Western Natural Gas utilizes close to 20% of that system's total requirements it becomes obvious that the addition of any considerable number of such type of customer would quickly absorb the presently estimated surplus.

It is further pointed out that if any theoretical surplus available for export be taken wholly from that part of the province which is south of Edmonton, it would leave us in the position that to meet the needs of our local utilities and other industrial use, it would be necessary for us to pipe the gas from the Peace River area, some 600 miles distant, at greater expense than would be the case were we to have gas nearer at hand.

Finally, the coal industry feels that, when cheap gas is essential for the industrial development of this Province and in view of the fact that the proven reserves appear to be so little, if at all, in excess of the estimated requirements of the Province, we should make sure that we do not prejudice potential industrial development here by being in too great a hurry to export our raw materials to add to the industrial developments of other areas and countries. In the past we have been too prone to export our natural resources in the primary form. If we are to round out our economy more emphasis must be laid on processing and

W. C. Whittaker,
Dir. Ex. by Mr. Milvain

- 3296 -

secondary industry.

Q Now, if I may interrupt you here, Mr. Whittaker, The following pages deal with factual matters regarding the coal industry, so that will you turn to page 9 where you see the heading "Conclusion", and you might read from there?

A Yes, sir.

Conclusion

The basic question which must be answered in this gas export question is: Will gas export be in the best interest of the people of the Province? So far as we are aware no Board or Commission has yet undertaken a serious and comprehensive study of the economic factors involved. We believe natural gas to be too valuable a resource to pipe out of the province on the sole ground that there may now exist a minimum exportable surplus beyond the foreseeable future needs for the next 30 years.

Before the granting of export permits is considered, we submit that the residents and consumers of this Province are entitled to complete and specific answers to the following questions:

- What will the people of Alberta gain by gas export?
- What will the people of Alberta lose by gas export?
- What would be the effect on business and other industries?
- What would be the result in the price of gas to the domestic and industrial consumers?
- What would be the effect on employment, both immediate and ultimate?

W. C. Whittaker,
Dir. Ex. by Mr. Milvain

- 3297 -

What will be the effect on the industrial future
of the Province?

What will be the ultimate effect on our agricultural
economy?

The answers to these questions are of
paramount importance to every citizen of the Province.
We do not believe that the issue should be judged simply
on the question of reserves or on the effect of gas export
on any one industry, but on the basis of its effect on the
economy as a whole.

If, after thorough and comprehensive
investigation by a competent body, it is decided that gas
export is in the best interests of the people of the
Province, we would not oppose its export. Until such
answer to this all-important question has been obtained,
we submit that it is not in the best interests of the
economy of Alberta to export natural gas.

Q Mr. Whittaker, you might answer any questions my learned
friends may have.

THE CHAIRMAN: Mr. Nolan?

MR. NOLAN: No, thank you.

THE CHAIRMAN: Mr. Steer?

MR. STEER: None, sir.

THE CHAIRMAN: Mr. Macleod, have you any questions?

MR. MACLEOD: No, thank you.

MR. C. E. SMITH: I will ask one to start with.

.....

W. C. Whittaker,
Exam. by Mr. C. E. Smith
Cr. Ex. by Mr. McDonald

- 3298 -

EXAMINATION BY MR. C. E. SMITH:

Q Mr. Whittaker, on page 10, you say,

"If, after thorough and comprehensive investigation by a competent body, it is decided that gas export is in the best interests of the people of the Province, we would not oppose its export."

Are you suggesting that my Board is not competent?

A Not at all, Mr. Smith.

Q If you are, you should have been here earlier, and we might have stopped two years ago?

A No, I would be quite happy to have this Board examine into it.

THE CHAIRMAN: Have you any questions, Mr. McDonald?

MR. McDONALD: Just one question, Mr. Chairman.

.....

CROSS-EXAMINATION BY MR. McDONALD:

Q At the top of page 3, Mr. Whittaker, you deal with the matter of the Peace River Gas being moved 600 miles south. I was wondering if you agreed with the conclusions reached by the Board in their recommendation in their Interim Report that there is beyond economic reach 219 billion cubic feet, and I think the same page of the Report discloses that of the 219 billion feet, that something over 100 billion cubic feet are in the Whitelaw field in the Peace River area. Do you agree with the Board's finding that that is beyond economic reach of the consumers in Alberta?

A I do not think I am competent to pass any judgment on that, Mr. McDonald.

Q I was wondering if that is what you had in mind in dealing

W. C. Whittaker,
Cr. Ex. by Mr. McDonald
Exam. by The Chairman

- 3299 -

with this paragraph at the top of page 3?

A Well, if gas export resulted in bringing or having to bring gas a long distance from the north, then undoubtedly somebody has got to pay for it and the price must go up.

Q Yes. That is all the questions I have, Mr. Chairman.

.....

EXAMINATION BY THE CHAIRMAN:

Q Mr. Whittaker, were you here when the brief of Trans-Canada Pipe Lines was presented by Mr. Trostel, in which there is a suggestion made that the Crown reserve gas should be made available to the Utilities in order that the price might be kept down as far as Alberta was concerned, and would you agree with that policy, Mr. Whittaker?

A I heard that mentioned, Mr. Chairman, but I do not think that comes within my province. I will leave that to the Board.

Q Well, there was a coal operator came to see me in Edmonton the other day, and he was a little bit exercised over the fact that they were trying to cut down the industrial price of gas in Edmonton, and that the gas might be used in the power plant and shut out his coal, and he felt that he was in a competitive position.

A Well, I know, Mr. Chairman, that it would not please everybody, whatever way you do it.

Q Do you think, so far as the coal operators are concerned, that they would be quite happy if the Government made cheaper gas available to the consumers by reason of the Crown reserves, and that might result in a reduced rate to the consumer?

W. C. Whittaker,
Exam. by The Chairman

- 3300 -

A Well, I would not go so far as to say that, but I do think that cheap natural gas in this Province is essential to its industrial development. We have always said that, and, as a general statement, I think that stands. I would not be prepared to say with regard to the details. I will leave that to the Board and reassure Mr. Smith.

MR. C. E. SMITH: I will agree with your last statement that you will leave it to the Board, and you will give them hell if they do not agree with you?

A We have done a little bit of that already, and it does not seem to affect them.

Q THE CHAIRMAN: Mr. Whittaker, have you prepared any answers to the questions that you pose on page 9?

A No, but I think those are the answers that we need.

Q You could not give us any assistance by suggesting the answers at all?

A Well, certainly I could not at the moment. I do think that in all seriousness those are things that are required, or that require a great deal of study, and while in a small way some of them may have been touched on, I do not think that any comprehensive or final study has been made on it, and that is what we are interested in.

Q Thanks very much, Mr. Whittaker.

MR. MILVAIN: Mr. Chairman, I have Mr. Angus J. Morrison here, and I would like to put him into the stand for about three minutes.

MR. C. E. SMITH: I object, he could not be there only for three minutes.

MR. MILVAIN: Well, we will make it ten minutes.

.....

Angus J. Morrison,
Dir. Ex. by Mr. Milvain

- 3301 -

ANGUS J. MORRISON, having been
first duly sworn, examined by Mr. Milvain, testified as
follows:-

Q Mr. Morrison, what is your position with the United Mine
Workers of America?

A I am the secretary-treasurer of the United Mine Workers of
America, District 18.

THE CHAIRMAN: Mr. Milvain, the Board knows Mr.
Morrison.

MR. MILVAIN: Thank you, sir.

Q And the Mine Workers of America are a member of the Western
Coal Federation of Canada which has submitted this brief?

A That is correct.

Q And I understand that you have perused this brief, Mr.
Morrison?

A Yes, I have.

Q And can you tell the Board whether or not you subscribe
to what is therein set out?

A We do.

Q In view of your intimate connection with labour, Mr. Mor-
rison, is there any additional comment you wish to make
beyond that set out in the form of the brief?

A Well, District 18 of the United Mine Workers of America,
and, I believe, organized labour in general, would be
chiefly interested in the effect of export on unemployment.
That is basic with organized labour. They must have
employment in order to live. And we, naturally, view the
question with some alarm, that is, that it is going to
affect the employment of our people in this coal industry.

Q Is there anything particularly in that regard that you have

Angus J. Morrison,
Dir. Ex. by Mr. Milvain
Cr. Ex. by Mr. Porter

- 3302 -

in mind, Mr. Morrison?

A Well, in some of the localities in the coal mining industry, the employees have built homes, contributed through taxation to building schools and streets, and have contributed generally to the general welfare of the community, and with a lessening of employment, lessening of earning power, and perhaps ultimate closing down of that industry, and they have seen different ghost towns, it would mean that their life's savings would be wiped out.

Q You might answer any questions my learned friends might have to ask, Mr. Morrison.

A Yes.

.....

CROSS-EXAMINATION BY MR. PORTER:

Q Just a question, Mr. Morrison. I think this Table might be useful that appears in Exhibit 119, and in that exhibit there is Table Number 6?

A What page?

Q Table Number 6, in Exhibit 119, which gives by Provinces the disposition of coal, coke and briquettes produced in Alberta.

A Yes.

Q Has any study been made to show what the loss of tonnage would be, assuming that the figures in evidence here of sales in this Province are realized? Let me illustrate. We have estimates here, for instance, what Western Pipe Lines say they will be able to sell at Moose Jaw, Regina and Winnipeg; we have the estimate of the Trans-Canada Pipe Lines of what they can sell there, or think they can; we

Angus J. Morrison,
Cr. Ex. by Mr. Porter.

- 3303 -

have statements that they do not anticipate making a complete displacement of competing fuel. Has anyone made any study in your organization to see whether, if those gas sales are realized, there will be a serious impairment of these productive figures?

A I will answer you in this way, Mr. Porter, that there is not a complete and detailed study.

Q Yes?

A There have been estimates made, but the shape of the industry at the moment is such that any loss in production they view with alarm.

Q Yes. But you do not know yet, no attempt has been made yet to find out Province by Province what the displacement would be?

A Not a detailed study, Mr. Porter; there has been estimates made.

Q Well, yes. Perhaps that is as well as we could do, although we have now available from two of the applicants estimates of the price level and quantities at which they propose in Saskatchewan and Manitoba to supply, and that material might be useful?

A It has been intimated, Mr. Porter, that gas might displace fuel oil in some places.

Q Yes.

A And that would be a question that would have to be gone into to see as to how much fuel oil and how much coal, too. We view with alarm any displacement.

Q Your position is that any displacement is serious?

A Yes, our position is that any displacement is serious.

Q All right.

.....

Angus J. Morrison,
Cr. Ex. by Mr. Macleod.

- 3304 -

CROSS-EXAMINATION BY MR. MACLEOD:

Q Mr. Morrison, that Table Mr. Porter referred to, in that Table you show shipments to the United States?

A Column?

Q Third from the end?

A That is Table 6?

Q Yes, Table 6?

A Yes.

Q Now, can you tell me, do you ship coal into Montana, the State of Montana?

A We ship coke there, Mr. Macleod, which is, as you know, made from coal, and we ship in quite substantial amounts.

MR. C. E. SMITH: What do you mean, "we"?

A The coal industry.

THE CHAIRMAN: Thank you, Mr. Morrison. We will adjourn until tomorrow morning.

(Hearing adjourned until 9.00 A.M. December 14th, 1951)

: : : : :

CROSS-EXAMINATION BY MR. NATHAN

Q Mr. Nathan, that Table Mr. Nathan referred to, is that

Table you show shipments to the United States?

A Column?

Q Third from the end?

A That is Table 6?

Q Yes, Table 6?

A Yes.

Q Now, can you tell me, do you ship coal into Montana, the

State of Montana?

A We ship coke there, Mr. Nathan, which is, as you know, in

from coal, and we ship in quite substantial amounts.

Q R. C. E. SMITH: What do you mean, "we"?

A The coal industry.

THE CHAIRMAN: Thank you, Mr. Nathan. We will

adjourn until tomorrow morning.

(Hearing adjourned until 9:00 A.M. December 14th, 1941)

.....

The Province of Alberta

IN THE MATTER OF THE PUBLIC
UTILITIES ACT

—and—

IN THE MATTER OF rates charged by
The Valley Pipe Line Company
Limited

G. M. BLACKSTOCK, Esq., K.C.
Public Utilities Commissioner

Session:

CALGARY, Alberta _____

VOLUME _____

